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VOL. LI No. 6 — JUNE 1936

The American City

Issued Monthly by the

American City Magazine Corporation
470 Fourth Ave., New York

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BRANCH OFFICES
Daily News Building, Chicago
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DUNCAN A. SCOTT, Representative

Subscription, $2 per annum in United States and Canada ($3 to foreign countries)
Single copies, 35c
Back numbers available

Entered as second-class matter, July 29, 1910, at the Post Office at New York, N. Y., under Act of March 3, 1879. Printed in U. S. A.

In THE MUNICIPAL INDEX AND ATLAS (the annual reference volume of data and condensed catalogs published by the American City Magazine Corporation) readers will find statistical material, and articles on a wide variety of municipal and public works subjects, not published in the monthly issues of the magazine.

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A city of Beautiful Homes

Beverly Hills
CALIFORNIA

Beverly Hills, wisely planned as an ideal residential community, has from its inception attracted discriminating people who appreciate its scenic charm and climatic advantages. Sloping upward from the coastal plain into the rugged foothills of the Santa Monica Mountains, it is but a short drive eastward over wide boulevards to the heart of Los Angeles and westward to the palisades and beach playgrounds of Southern California.

The city, which has an estimated population of 25,000, is governed by five councilmen, elected at large and serving without compensation, one of whom acts as Mayor. Each department is administered by a competent staff quickly responsive to the needs of citizens, property owners and the public.

Beverly Hills is furnished with an abundant supply of pure water obtained direct from wells, and as in thousands of other municipalities, you will find Pittsburgh Water Meters doing their part towards providing a just and equitable revenue for the water department.

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PITTSBURGH WATER METERS

Court Setback—Legislative Forward Step

Resettlement Administration Only Partially Unsettled

The leading article in this magazine last month having been devoted to "The Greenbelt Towns," the following analysis of the subsequent court decision affecting one of these projects has especial interest and timeliness. For this excellent statement of the scope and implications of the decision, THE AMERICAN CITY *is indebted to Ira S. Robbins, Counsel of the New York State Board of Housing.*

RESETTLEMENT "GREENBELT" PROJECT HELD INVALID

THE Resettlement Administration was enjoined from proceeding with its Bound Brook, N. J., Greenbelt project, by a three to two decision of the United States Court of Appeals for the District of Columbia, rendered on May 18, 1936. The action was brought by the township of Franklin, the Board of Education of the township, and several individual property owners, against Rexford G. Tugwell, Administrator of the Resettlement Administration, and other Federal officials. The decision was rendered upon an appeal from a decision of the Supreme Court of the District of Columbia which had granted, without opinion, the motion of the defendants to dismiss the bill of complaint.

In a long opinion the Court held that the provisions of the Emergency Relief Appropriation Act of 1935, pursuant to which the Resettlement Administration was created, constituted an invalid delegation to the President of the Congressional power to legislate. Ordinarily, Congress may lay down policies and establish standards, leaving it to the appropriate government agencies to make subordinate rules within prescribed limits, to fill up details and to determine the facts to which the policies as declared by the legislature apply, but, said the Court, under this Act no policies or standards were laid down, and the President is free to decide when, where and how some kind of a "housing" project can be established.

This objection to the legislation could be cured by amendment to the original Act or by new legislation. However, the Court went further and held that the Federal Government has no power to engage directly in housing activities, for two reasons: first, that such activities are not within the scope of the powers granted to Congress, because housing projects "have no connection with the general welfare"; and, second, that such activities are reserved for action by the states alone. "Hence legislation by Congress for that purpose is forbidden."

This is the first time that any court has specifically passed upon the foregoing points. The questions were discussed but not decided by the Circuit Court of Appeals in the case of *United States v. Louisville, et al*, which involved the right of the Federal Government to condemn for housing purposes. They were also discussed at length in the briefs filed in the Supreme Court in that case, but it will be recalled that the Government withdrew its appeal in the Supreme Court.

The majority of the Court held that the questions of constitutionality could be determined from the face of the Act, while the minority were in favor of granting a temporary injunction and sending the case back to the lower court for trial on the various issues of fact and in order to enable the parties to develop facts and circumstances which might bear upon the constitutionality of the Act.

The Court also, by majority and minority opinions, disposed of various preliminary technical objections upon which counsel for the Government had relied greatly. The defendants had urged that the action was not maintainable because it was in effect a suit against the United States, which had not consented to be sued. The Court held that the action was not against the United States itself, but one to restrain agents of the United States from performing allegedly illegal acts. It further found that the property owners who had given options on their property were not indispensable parties to the suit, that the township and the individual plaintiffs, but not the Board of Education, had capacity to maintain the suit, because of the effect of the project upon local taxes. Several of these questions had never been directly decided by the courts.

The advisability of appealing from the decision to the United States Supreme Court is under consideration. Federal officials have announced that in their opinion the decision of the Court affects only the Bound Brook project and does not affect other agencies of the Government or other activities of the Resettlement Administration. However, the decision opens the way for similar injunctions against the three other suburban housing projects.

The Court, which by some of its previous decisions has indicated a lack of sympathy with policies of the present administration, obviously went far beyond the precise issue before it and expressed far-reaching opinions on the constitutionality of any housing activities by the Federal Government. A number of weighty reasons which might have led the Court to different conclusions after the facts had been developed upon a trial of the action were not presented to the Court and apparently were not considered by it.

The pending Wagner-Ellenbogen bill for the establishment of a United States Housing Authority is drawn so as to eliminate any objection on the ground of invalid delegation of legislative power. Should that bill become law, the decision in the Bound Brook case, if upheld on appeal, would not affect the powers of the Authority to make loans and grants to local agencies, but might well affect its right to erect "demonstration" projects.

STATEMENT BY DR. TUGWELL

R. G. Tugwell, Administrator of the Resettlement Administration, issued on May 19 the following statement:

"As the Attorney General announced yesterday, the decision of the United States Court of Appeals for the District of Columbia in connection with the Bound Brook project is limited to that particular undertaking.

"Until there is a final judicial determination by the Supreme Court of the United States, the Resettlement Administration will proceed with its other suburban resettlement projects.

"The Attorney General has announced that consideration is being given for an immediate application for certiorari.

"The various other activities of the Resettlement Administration are not affected by the decision."

IRA S. ROBBINS.

New York Act Authorizes Partial Exemption of Improvements from Taxes

ONE of the last acts of the New York Legislature prior to its adjournment last month was to adopt the following Act—which has since been signed by Governor Lehman—to amend the tax law, in relation to exemption from local taxation of alterations and improvements to existent buildings in cities of one million inhabitants or over:

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

Section 1. Chapter 62 of the laws of 1909, entitled "An Act in relation to taxation, constituting chapter 60 of the consolidated laws," is hereby amended by inserting therein a new section, to be section 5-a, to read as follows:

Section 5-a. Exemption from local taxation of alterations and improvements to existent buildings, except those increasing the gross cubic area thereof. Any city of the state, having a population of one million inhabitants or more, acting through its local legislative body, is hereby authorized and empowered until July 1, 1937, to adopt and amend local laws providing that alterations and improvements to existent buildings, except in so far as the gross cubic area of the building is increased thereby, shall be exempt from taxation for local purposes during construction and upon completion for a period not to exceed five years after completion, provided that construction was started after the effective date of this Act and completed before October 1, 1938, and further provided that in no case shall such alterations and improvements be exempted to an extent greater in valuation than the valuation of the previously existent building appearing on the assessment rolls on the first day of October next preceding the commencement of said improvement.

Section 2. This Act shall take effect immediately.

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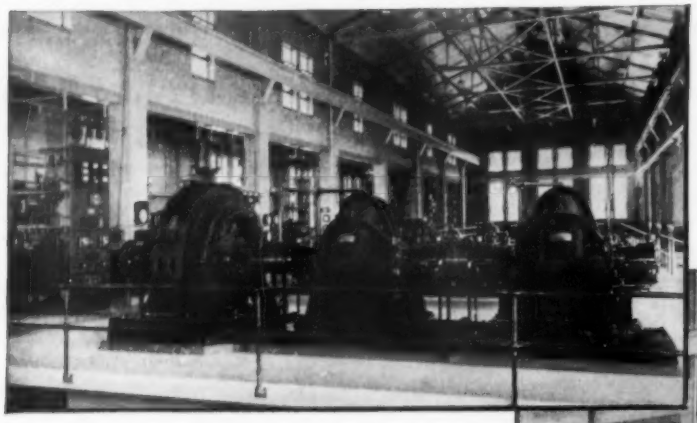

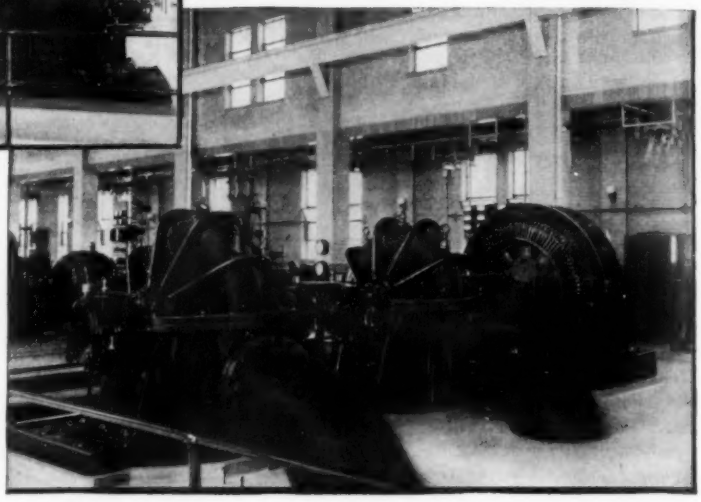

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A-38168

Our Municipal Notebook

That Parking Problem

SINCE the availability of parking meters, the parking problem has assumed an entirely different aspect. There is now a choice between the "honor system" of parking, so to speak, and the pay-if-you-park-in-congested-areas system. Which is the better method?

Suffice it that those cities that have pioneered in the use of parking meters not only express satisfaction with the results,—meaning that the meters solve the problem,—but also point to the system as their brightest achievement of the year.

Suffice it, that practically everywhere else the parking problem is becoming increasingly difficult.

The fact is, the use of motor cars has outrun practically all except service facilities for taking care of them. The Regional Plan Association of New York City states this situation in the first paragraph of its current survey of 54 communities: "Many millions of dollars have been spent in the New York Region in the past decade for the provision of highways, parkways, and widened streets to facilitate the movement of motor vehicles. Comparatively little has been done to provide a place for these vehicles to park when they have reached their destination."

The parking problem exists, of course, only in congested areas, which is usually synonymous with the business district. The problem has several equations. The public coming into the business district wants to find a place to park. Because it often cannot, it frequently double-parks. The merchants recognize that "good parking is the prime requisite for a successful shopping center," in the words of Charles V. Dolan, Secretary of the Quincy Merchants Association. The municipal authorities are involved in the entire matter, including the over-use of the streets.

Why not municipal parking spaces? Many cities do provide such space, but only by chance are these spaces scientifically located. The chambers of commerce of 48 New England cities have reported free municipal parking spaces in exactly half of these cities.

Bar Harbor, Maine, provides space for 150 to 200 cars, at a cost to the city of $15,000. Woonsocket, R. I., has two spaces (one of which cost $75,000) and is planning another space for 500 cars. Brattleboro, Vt., parks 100 cars at a cost of $20,000. Waltham and Quincy are considering spaces that will cost them $125,000 or more to accommodate 1,200 and 2,000 cars respectively.

This method can therefore be expensive. Furthermore, while it does provide a place to park in the business district, the place may be blocks from where the car occupants desire to transact business.

Under the parking meter system, the natural tendency is to get through and away within the metered time. There is no reason, of course, why there should not be both parking spaces for free and long-time parking, and parking meters for shopping and other short calls.

N. J. on Business Machines

WHEN India rules England it may then be that an inefficient municipality with old-fashioned accounting methods can tax and otherwise regulate satisfactorily the live-wire commercial houses that transact business in it. Here is what *New Jersey Municipalities* says about it:

"Machine accounting and modernized methods, as used in commercial accounting, have taken over the public office, and the taxpayer is the beneficiary. What has happened in Cuyahoga County, Ohio, is happening in a varying degree all over the country. No longer can costly antiquated hand-written records satisfy the needs of governmental office either from the standpoint of economy or required speed. The same degree of efficiency which has been a requisite in the commercial firm is now demanded in the conduct of the public's business, and public officials everywhere are revising their offices accordingly."

Pumping Engines Sent to the Flood Areas

FROM time to time THE AMERICAN CITY is asked to cite examples of cooperation among municipalities. The recent floods offered outstanding opportunities for displaying that form of cooperation that expects nothing in return. To cite only one example, during the disastrous flood in Wilkes-Barre and Wyoming Valley, the New York City Fire Department sent three reserve pumping engines fully manned and in charge of a deputy chief. C. A. Leighton, Chairman of the Disaster Relief Committee of The American Red Cross in this area, writes:

"The arrival of equipment and competent men at a time when disaster was at its peak did much to keep up the morale of our people, and it made us who were handling their disastrous problem stronger in spirit with the knowledge that the resources of our great neighboring communities were behind us.

"The New York Fire Department equipment's pumping of the basement of the Bell Telephone Co. Building made possible the continuance of our only means of communication in our rescue work, and when you realize that we rescued 10,000 people without the loss of a life in strong currents, the importance of every element of help is apparent.

"To further indicate what the display of neighborly consideration of our cities meant, I send herewith copy of a letter sent to Mayor F. H. LaGuardia, even at the time when strain and stress were terrific:

"'My dear Mayor:

"'This is to advise you of the sincere and heartfelt appreciation of the people of Wilkes-Barre and Wyoming Valley in your kindly consideration of them in their hour of distress.

"'The coming of your Fire Department equipment and its competent men has meant much to us. Particularly, at a time when our resources were nearly exhausted, the taking over of the pumping of water out of the Bell Telephone Building and thereby making it possible to maintain the only means of communication in our rescue work is, in itself, a great emphasis of our need for them.'"

More Facts on Local Transportation

THERE is so much interest in city transit at this time that John Bauer, economist and head of the American Public Utilities Bureau, proposes a clearing house of transportation information for municipalities. This is one type of service to transportation and is likely to keep interest stirred up in the subject. Certainly the best way to improve a situation is to discuss it. By this process, the entire problem is tackled on a broader basis. The transit problem has of course been discussed ad infinitum, but to quote Dr. Bauer's proposal:

"Public officials and others interested in progressive mass transportation have had great difficulty in getting basic facts for establishing sound municipal policy.

"Municipal officials can get little help in these questions from most existing agencies of fact collecting.

"No busy municipal official can possibly, through his own direct efforts, keep contact with the tremendous changes taking place all over the country. Nevertheless, if he is to serve his community, he must maintain such contact."

And the municipal official, not only through the franchise power, but also through the avenues of public appeal, is perhaps the determining factor, as indicated by this from a city manager:

"Investigations were made by city officials and by utility officials as to the best transportation system as it affected an industrial city of 50,000. After a prolonged study of the problem, the city of ——— requested that a trackless trolley system be installed. This was agreed to by the utility company, and the necessary legislation was enacted."

...A TOWN GROWS...AND ELEVATED STORAGE GROWS WITH IT...

Alva, Okla., Enlarges System Installed Twenty-Four Years Ago

ONE of the best things about a gravity water system is its ability to stay modern and "grow" as the needs of a town increase. An interesting example of this is offered by the town of Alva, Oklahoma, which has installed the 500,000-gal. Radial-Cone elevated tank pictured above. Located on the Salt Fork branch of the Arkansas River near the panhandle section of the state, Alva has more than doubled its population since the first Horton tank of 300,000-gal. capacity was installed in 1912.

As a result of foresightedness on the part of Alva officials, the first tank was of sufficient capacity to meet public needs for many years. It was only recently that the demand became pressing for additional capacity. Meeting this demand involved little difficulty and was accomplished with minimum expense. Without rendering the existing system obsolete, the new tank was merely added to supplement the capacity of the older tank. Both have the same high water elevation although some distance apart. The wells supplying the system are on the opposite side of the town so that the center of population is served from two directions during peak-load periods.

And now Alva is well prepared for another span of years in which the water supply service will continue to be modern and efficient—yet always in a position to "grow" some more if the need arises.

* * * * *

Let us give you the facts about the improvements in service and reductions in pumping costs that can be secured with properly designed elevated storage. Write our nearest office for estimating data.

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Boston.....1501 Consolidated Gas Bldg.
Birmingham.....1502 N. Fiftieth Street
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Fabricating plants in CHICAGO, BIRMINGHAM, and GREENVILLE, PA.

Water Rates—Water Treatment

Seattle, Wash., Water Rates Changed

THE city of Seattle, in Ordinance 65877 effective January 1, 1936, has made several changes in the water rates as recorded on pages 85 and 87 of the August, 1935, issue of THE AMERICAN CITY, in installment XVI of the series, "Water Rates and Service Charges."

All water used for domestic or commercial purposes must be metered. The rates for metered water supplied within the city of Seattle in one month or a fractional part of a month are as follows:

Size of Service	Quantity Allowed	Minimum Charge
¾" or less	500 cu. ft. or less	$0.45
1"	700 " " " "	0.60
1½"	1,400 " " " "	1.00
2"	2,200 " " " "	1.50
3"	3,900 " " " "	2.50
4"	5,600 " " " "	3.50
6" or larger	8,100 " " " "	5.00

Each 100 cubic feet in excess of the quantities allowed under the minimum charges above is furnished at 6 cents per hundred cubic feet. For each separate building or premises in addition to the first or principal building or premises supplied through the same service connection, the charge for 500 cubic feet or less of water is 45 cents.

Water used exclusively for manufacturing purposes, laundries, privately and publicly owned golf courses and the operation of elevators, is billed at 4 cents per 100 cubic feet in excess of the first 30,000 cubic feet. A similar rate applies to water supplied to School District No. 1, University of Washington, Port of Seattle, Fort Lawton Military Reservation, and Sand Point Naval Station, and to other governmental units, as directed by the City Council. Water supplied to the City Lighting Department and to the Municipal Railway Division is billed at 4 cents per 100 cubic feet in excess of the amount allowed in the minimum charges.

The rates for metered water supplied to premises outside the limits of the city of Seattle per month or fractional part thereof is billed as follows:

700 cu. ft. or less	$1.00
Each separate building or premises in addition to the first or principal building or premises supplied through the same service connection, 700 cu. ft. or less	1.00
Each 100 cu. ft. in excess of the first 700 cu. ft., except as hereinafter provided	.10
Each 100 cu. ft., where 200,000 cu. ft. or more is used in one month, except as hereinafter provided	.08
Each 100 cu. ft. in excess of the first 30,000 where 80 per cent of the water is used for manufacturing and industrial purposes, golf courses and cemeteries	.07

A study of these rates will show that the minimum rate for a ¾-inch service or less is 45 cents per month for 500 cubic feet, without any additional service charge. It is believed that this is the lowest water rate in the United States for any city of comparable size.

H. D. FOWLER,
Superintendent, Water Department.

A Superlative Water Tank

THE *Intake*, the delightful monthly publication issued by the Department of Water and Power of Los Angeles, Calif., for its employees, in December published the story of a water tank which, to paraphrase Ben Bernie, is "the estest of the esta." Situated in the rolling hills of Hollywoodland, Calif., over 1,300 feet above sea level, is this unique tank in the Los Angeles water system. The Tyrolean Drive tank may well be termed a superlative tank—smallest, remotest, and oddest.

The tank is nothing more than several sections of 54-inch diameter salvaged pipe welded together to a length of 88 feet. It lies in a horizontal position on the ground, both ends having been welded tight.

Its capacity of 9,800 gallons, while small in comparison with the average water-storage tank capacity, is adequate for the few scattered homes which cannot be reached by the Innsdale tank, 65 feet lower in elevation. A small automatic pump at the Innsdale site pumps water from that tank to the Tyrolean Drive tank.

Water Rates for Burlington, Wis.

THE Common Council of Burlington, Wis., has requested the Public Service Commission of the state of Wisconsin to approve the following schedule of rates for water furnished to consumers within the city:

First	1,200 cu. ft. per 6 months	Min. charge, $2.50
Next	8,800 " " " "	15c per 100 cu. ft.
"	15,000 " " " "	12c " " "
"	75,000 " " " "	9c " " "
Over	100,000 " " " "	8c " " "

This ordinance, adopted October 7, 1935, makes these rates retroactive to July 1, 1935.

Glenfield, Pa., to Purchase Water from Neville Township

THE Borough Council of Glenfield, Pa., has passed an ordinance contracting to purchase water from the Neville, Pa., Township Commissioners at a cost of 20 cents per 1,000 gallons, which is the same price charged the Neville Township Commissioners by the Pittsburgh Suburban Water Company. Glenfield will install and maintain a meter, valve, the necessary mains and a shelter over the connection, meter and valve.

The contract provides that the quarterly bill will be due on the 15th of the month, and a 5 per cent penalty will be added after the 15th. The borough is to construct and maintain the mains, patrol and control the system, find and repair leaks, and be responsible for damages and costs of laying the line. The Neville Township Commissioners will supply 1,200,000 gallons of water a year as a minimum, and the borough is to pay ordinance costs, costs of a hearing before the Public Service Commission, and costs of the state and national permits, and safeguard the Commissioners from suits due to lack of water. The term of the contract was set at 25 years but may be terminated or renewed with two year's notice.

Steam Pumping Engines in Philadelphia

THERE was a water pumping system in Philadelphia by 1800. Two engines were supplied by Nicholas Roosevelt, an ancestor of President Franklin D. Roosevelt. The engines and boilers were made largely of wood. One engine of 32-inch bore by 6-foot stroke drove an 18-inch pump. The other had a 40-inch bore and a 6-foot stroke and drove a 17½-inch pump. The boilers were rectangular chests of 5-inch white pine, measuring 9 feet by 15 feet. The firebox, of wrought iron, was 3 feet square, with cast iron flues. The maximum steam pressure was 4 pounds. After seven years of service, cast iron boilers replaced the wooden ones.

—Courtesy of *Esso Oil-Ways*.

Removing Lead from Drinking Water

EXPERIMENTS conducted in England have shown that base-exchange materials can remove all traces of metals such as lead, copper, zinc and tin from water. The subject is of importance, since considerable quantities of these metals can be present in drinking water under certain conditions. An application of the results of the experiments has been the development of a method for determining the true average concentration of lead in drinking water drawn from a household service over a period of weeks. In the past it has been usual only to determine probable extreme concentrations of lead in the water by the examination of small samples collected after the water had remained stagnant in the pipes over night, and after the water had been allowed to flow for some time. By the new method, the drinking water withdrawn during several weeks is measured by means of a meter and is passed through base-exchange material contained in a small filter, which can conveniently be attached to the water tap. At the end of the period, the material in the filter, which removes the whole of the lead from the water, is examined by chemical analysis.

—From the Report of the Water Pollution Research Board, London, England, for the year ended June 30, 1935.

TOUGH RUBBER* MEANS MORE MILES ON CITY HAULING JOBS

Now

IMPROVED HIGH PROFILE GOODYEARS GIVE EVEN LONGER TIRE LIFE

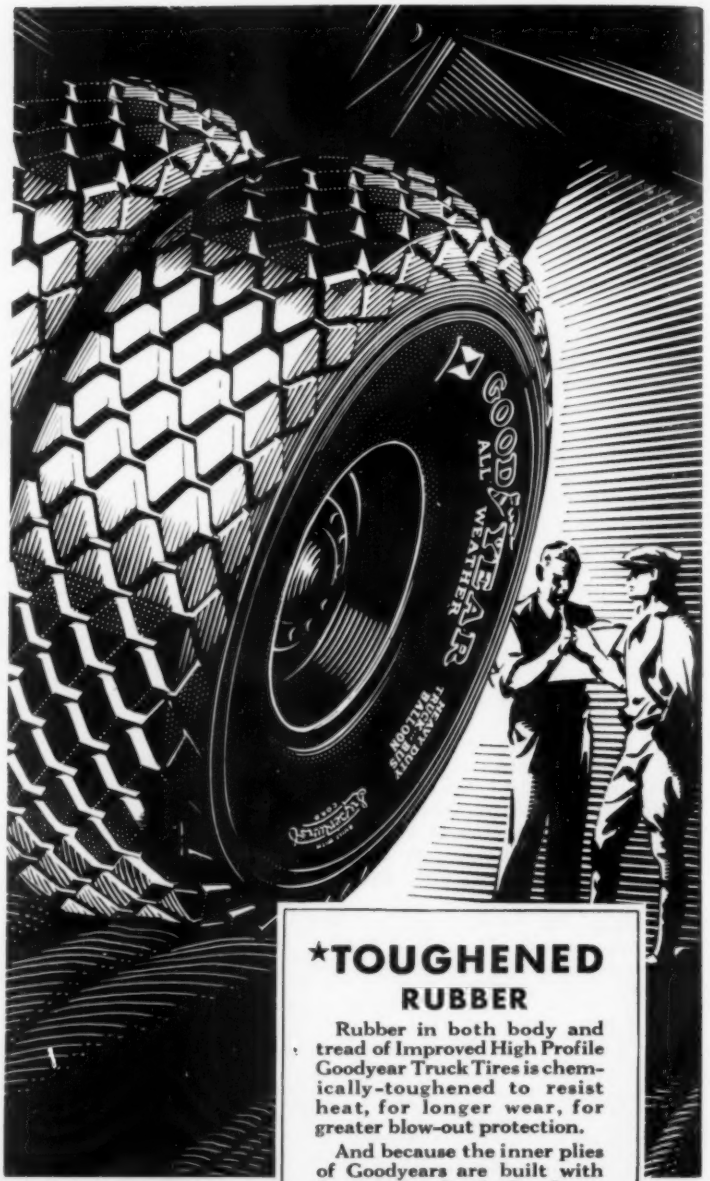
Tough rubber? Yes! Improved High Profile Goodyear Truck Tires are built with chemically-toughened rubber in both body and tread. That means strength, durability—longer, more dependable, more economical tire service on your city owned trucks and buses.

But that's only one reason why these Improved High Profile Goodyears will bring better tire performance to your job. Look at these features: Wider, flatter All-Weather tread with deeper non-skid design—more rubber on ground, better grip, better pull. Higher sidewalls—longer flexing zone generates less heat and provides greater area for more rapid diffusion of heat that is generated. Greater cubic volume—*more rubber, more air space, more miles of wear.*

You have to see these Improved High Profile Goodyear Truck Tires to appreciate them. Once you put them on your city owned trucks and buses you'll know what we mean when we say—They're MONEY SAVERS.

GOODYEAR K-RIMS *make tire changing easy—give added strength and safety—save time and money.*

THE GOODYEAR TIRE & RUBBER CO., INC., AKRON, OHIO



*TOUGHENED RUBBER

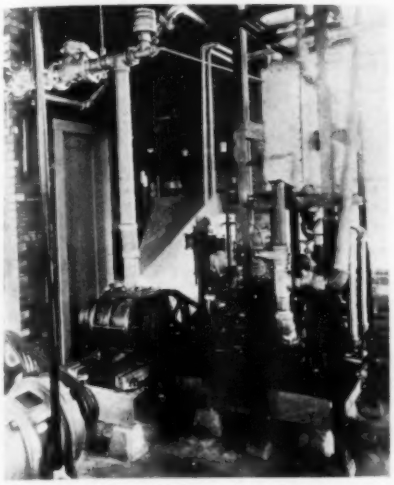
Rubber in both body and tread of Improved High Profile Goodyear Truck Tires is chemically-toughened to resist heat, for longer wear, for greater blow-out protection.

And because the inner plies of Goodyears are built with Supertwist Cord, Goodyear engineers are able to put into them a greater amount of chemical toughening.

In Goodyears there's blow-out protection in EVERY ply.

GOODYEAR TRUCK TIRES money savers

Utilization of Sewage Gas



THE GAS ENGINE OPERATED BY SEWAGE SLUDGE GAS AT GREENCASTLE, IND.

Sewage Gas for Power at Greencastle, Ind.

OPERATING on sewage gas derived from digesting activated sludge, a Ford V-8 motor in Greencastle, Ind., has been in operation for over a year with only minor repairs. The V-8 engine serves two functions in the plant. Power from the engine drives the air blower supplying oxygen to the aeration basin, and further heat from the engine cooling system is used to keep the sludge digestion tank at a temperature favorable to the production of gas through optimum digestion. The gas is piped to the air intake of the engine, where, mixed with the proper amount of air, it enters the motor.

The engine has been in successful operation since March 1, 1935, using sewage gas exclusively as fuel. It runs 24 hours a day, 7 days a week, at a speed of 1,500 rpm. Two regular Ford water pumps are used to pump the cooling water nearly a quarter of a mile to the digester tank through the coils, and back to the engine. According to the engineer in charge, only minor repairs have been necessary during a year's operation and the engine is performing as well as when first installed.

Operating a 200-hp Engine with Sludge Gas

ON May 4, 1935, a 200-hp Clark gas engine was placed in service at the treatment plant of the Los Angeles County Sanitation Districts, to supply power for pumping the effluent through 4 miles of 36-inch concrete line at from 15 to 25 pounds pressure. The engine is of the vertical 6-in-line type, and conventional 4-cycle L head design, both valves being on one side and operated by a common cam-shaft. The cylinders are 9-inch bore and extend low enough so that the skirt of the piston is never exposed. The pistons are of aluminum, have an 11-inch stroke and are each provided with five compression rings, two oil rings and one wiper ring. The compression ratio is 5.85 to 1, giving a compression pressure of 135 pounds per square inch. Oil is pumped through the rifle drilled crankshaft and connecting rods to all working parts of the engine at 30 pounds pressure after being filtered and cooled. An independent auxiliary oil system supplies oil under pressure to the high-pressure side of the cylinders. The ignition system consists of a single unit high-tension magneto and airplane self-cleaning spark plugs set in the center of the head. The cooling water is pumped through 200 feet of 2-inch steel water pipe submerged in the effluent wet well. The average operating temperature of the cooling water is about 130 degrees F. The unit is housed in a low metal building, and the summer sun exercises a strong influence upon the operating temperature. Operating speeds range from 370 to 550 rpm, developing from 70 to 200 hp. The total daily power output is about 4,000 hp-hours.

The engine is started with air compressed to 185 pounds pressure by a small electrically driven unit. Starting is about as simple as starting a motor car, once the peculiarities of the gas and of the engine have been discovered. Sludge gas has a narrow firing range, and the gas-air ratio must be nearly correct before combustion will occur; therefore, it is essential that the starting unit have sufficient capacity to keep the engine in motion long enough for the operator to discover the firing range of the gas available at the time of starting.

The engine is directly connected by a flexible coupling to a 22 x 18-inch Fairbanks-Morse horizontal centrifugal pump. No clutch or other means of disengaging the pump and engine are provided. This arrangement works very well, since the pump has very little drag until the engine gains momentum. The pump is of the bottom suction, split case type and when operated at top speed of 550 rpm will deliver 12,500 gallons per minute at 25 pounds line pressure.

The fuel for this engine is the usual type digester gas, having a calorific value of about 650 B.t.u. per cubic foot. The gas consumption of the engine is 24 cubic feet per horsepower hour when the engine is operating at 550 rpm under full load and best efficiency. After the engine had been in continuous service for 575 hours the cylinder heads were removed and the valves were examined. There was no corrosion of the valves and no carbon deposits in the cylinder heads or upon the pistons.

—From a paper presented before the California Sewage Works Assn. by C. F. TENNANT, Chief Operator, Los Angeles County Sanitation Districts.

Sludge Digester Gas Utilization at Palo Alto, Calif.

IN March, 1935, a gas engine and generator were installed at the Palo Alto, Calif., plant to use the sludge digester gas as a source of power for generating electricity to run the plant. The gas is also used for heating the laboratory and office and for the laboratory burners. A gas line was run from the plant to the Palo Alto airport, which is near the plant. The gas is used there for heating. It is intended to make some experiments soon on the use of digester gas in gas beacons for lighting the airport and landing field.

The use of digester gas for these purposes has been most satisfactory. No corrosive or deleterious effects have been noted. The only trouble has been that not enough water traps were installed, and the meters sometimes fill up with water and must be emptied. Blow-offs have been put on the gas lines.

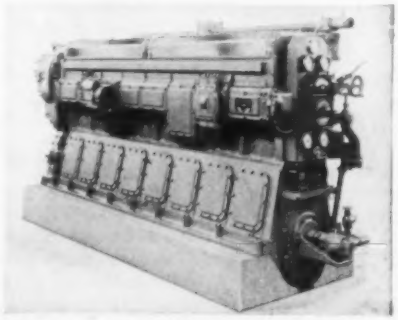
—From a paper on the Palo Alto sewage treatment plant presented before the California Sewage Works Association by HARVEY O. BANKS, formerly Chief Plant Operator.

Sludge Gas for Power on PWA Installation

ANOTHER example of sewage and sludge helping to dispose of themselves is found in the Madison Metropolitan Sewerage District plant at Madison, Wis. A vertical gas engine, rated at 222 hp at 514 rpm, will soon be operating on sludge digester gas. This Cooper-Bessemer Type EN-8 engine is directed-connected to a Roots-Connersville blower to furnish air for the activated sludge treatment.

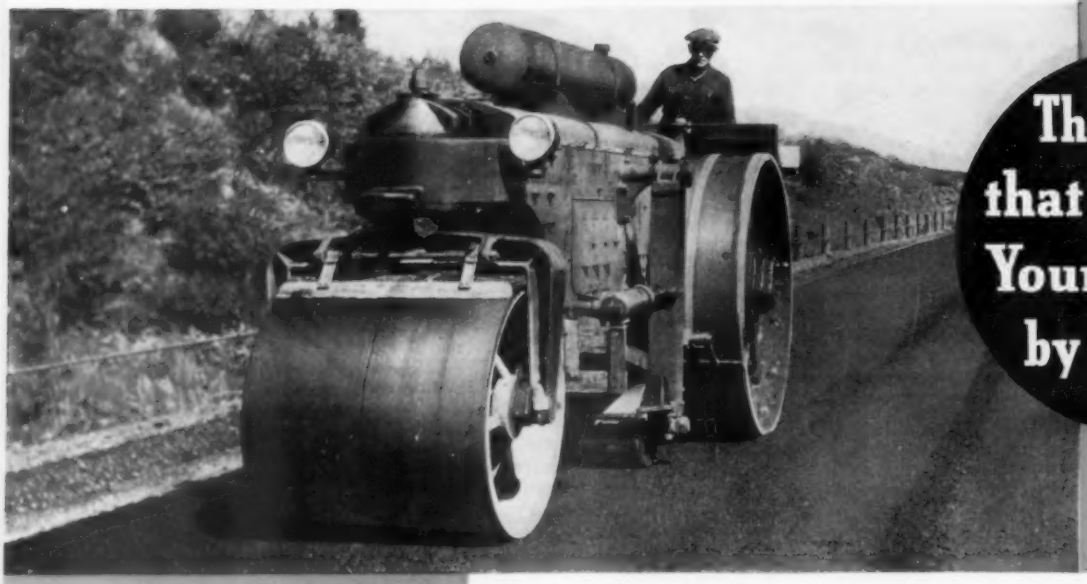
The sludge gas will be collected by a hood over the digesters, stored in gasholders, then drawn off and burned in the engine. Completing the cycle of efficiency, the exhaust gases from the engine go into a heat exchanger where water will be heated and are used for heating the digestion tanks.

H. O. LORD,
Engineer, Metropolitan Sewerage District, Madison, Wis.

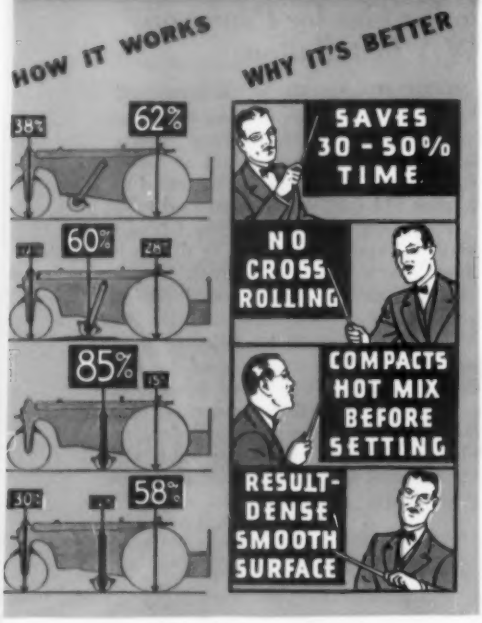


THE ENGINE RUN BY DIGESTER GAS AT MADISON, WIS.

Roll-A-Plane



The Machine that is taking Your Industry by Storm!



● Its "spot pressure" center roll creates *unequalled pavement stability—straight-edge smoothness in one-third less time.*

These are the major reasons for the swing towards the Austin-Western Roll-A-Plane. As more and more contractors and engineers see it and learn its value in operation, the significance of its simple yet revolutionary principle with its possibilities for extra profit becomes obvious.

Uneven pavement is brought to grade in a fraction of the time formerly required since the center roll, acting as a moving straight-edge, finds and reduces the high spots.

Not only that—the kneading action of the small diameter center roll causes the aggregate to key more closely than is possible with large diameter conventional rollers, giving the finished highway a resistance to traffic action which will add years to normal life while reducing the cost of maintenance.

Austin-Western conceived the idea of the Roll-A-Plane, tested and perfected it for every kind of road rolling. Such developments are to be expected from the company that makes the world's most complete line of road building machinery.

Write today for complete details on this, or any other machine listed below. Or use the coupon.

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Refuse Collection and Disposal

Who Collects the Refuse?

THERE are few municipalities in New York State having a separate department responsible for collection and disposal of ashes, garbage, and rubbish. In most instances this work is administered under the Department of Public Works or the Street Department, where it may be carried on as incidental to other activities or as a special division.

A recent report published by the New York State Conference of Mayors and other Municipal Officials states that ten villages have separate Sanitation Departments and, of these, eight are concerned only with ashes, garbage and rubbish. Of the eight, however, most are really divisions of other departments, rather than separate units.

In the remaining villages having municipal collection, the work is administered as follows:

Department of Public Works	10
Street Department	7
Village Engineer	1
Highway Department	1

Of villages having contract collection, the contracts are under:

Board of Trustees	4
Engineering Department	1

Eight cities have separate Sanitation Departments, and four of these are concerned only with ashes, garbage and rubbish. Thirty-four cities have no separate department. Where no separate department exists and the collection is conducted by the municipality, the work is administered under:

Department of Public Works	11
Street Department	4
Maintenance and Operation	1
Department of Public Service	1
Public Safety	1

Of cities having contract collection, the contracts are under:

Health Department	6
Department of Public Works	4
Mayor or Council	3

All municipally operated systems are administered by engineering departments, that is, Departments of Public Works, Street Departments, etc. Where the work is done by contract, the contracts are frequently under the jurisdiction of the Health Department.

Refuse Collection Costs Nominal for Complete Service

THE collection of garbage, ashes, and rubbish in the city of Hackensack, N. J., is exceptionally well done. In very few cities in the country is equally complete service rendered. The service includes going into basements and removing ashes and garbage, which is indeed exceptional service in that most cities demand that all refuse be placed at the curbs. The people of Hackensack wish to have this service and apparently are willing to pay for it. When the cost is analyzed, it is rather nominal for the service performed.

For example, the population of Hackensack for 1934 was 26,800. The average family in Hackensack is 4.1 persons. This would mean that there were 6,537 families in the city. The cost of garbage and ash collection in 1934, plus the cost of incineration and the operation of the refuse grounds, was $32,917.92, or a cost of $5.04 per family for the entire year. This nominal cost includes not only collecting garbage, ashes and rubbish, but also disposing of it. All garbage and refuse that will burn is disposed of at the incinerator, and the remainder is disposed of at various dumps throughout the city where the fill can be used to advantage on waste land.

—From the General Report of the city of Hackensack, N. J., for two years ending July 17, 1935.

Glendale, Calif., Business Pays for Collection

AN ordinance was passed October 3, 1935, by the City Council of Glendale, Calif., requiring a fee for the collection and removal of rubbish from boarding houses, hotels, offices, shops, stores or places of business. Domestic garbage and refuse will still be collected as part of the city service without extra charge.

Each establishment pays $3 a quarter in advance on January 1, April 1, July 1 and October 1 for each 25-gallon receptacle to be emptied at one collection, and $6 per quarter for a 50-gallon receptacle. The sum of $3 per quarter is charged for each additional 50-gallon receptacle or smaller to be emptied at one collection.

When the establishment pays its quarterly fee, a tag or ticket is issued specifying the quarter for which the payment is made, and the size of receptacle. This tag must be attached to the receptacle on each collection day. The ordinance requires that every person, firm or corporation shall secure an individual tag, and no two or more persons or firms may deposit their rubbish or garbage in the same receptacle.

L. E. Olson,
Mayor.

Garbage Collection and Disposal in Houston

DURING 1935, according to the Annual Report of the Garbage and Scavenger Departments of Houston, Texas, twenty-four trucks, thirteen wagons and four ash carts were operated. Collections were made with contract equipment starting every morning at 7 o'clock and supervised by city inspectors.

During the year the Department collected rubbish of every description, including shrubbery that was placed at street curbs or in alleys where trucks and wagons could collect it without going onto private property. The contractor was required to carry liability and personal insurance and was responsible for all damages and accidents, thereby relieving the city of any responsibility. He was also held responsible for damage to such household property as garbage cans, and was required to replace them when broken or taken away.

During the year 198,138 tons of garbage, rubbish and ashes was collected at a cost of 51.22 cents per ton, the total cost of collection for the year being $101,500. This tonnage was destroyed in the six municipal incinerators at a cost of $39,500, or 19.95 cents per ton. The Department removed 21,625 dead dogs and cats and 299 dead horses and cows from the streets and destroyed them by burning.

Lost motion has been practically eliminated in the Department. The trucks are each assigned to one of the six incinerators, preventing congestion at any plant. All trucks and wagons are of the dump type, speeding up the unloading at the plants.

All garbage and trash from hotels, restaurants and hospitals was removed by private hog raisers. This work was done at night between 6 P.M. and 7 A.M., saving the city about $25,000 per year. The work was supervised by one city inspector.

The Houston Paper Stock Co. collects all paper from business houses in the downtown section, saving the Department the cost of one truck, or about $3,500 per year, collecting 1,824 tons.

The Inspection Division consists of a Chief Inspector, and 21 sanitary inspectors, each assigned to a fleet of trucks or wagons and to a certain district, for which he is held responsible. All garbage is collected in each district on its collection day, regardless of the number of hours required, the equipment being held in service until work is completed. The Department is now collecting garbage on all boulevards and main thoroughfares daily. The Commission Row is swept daily and the refuse hauled away, and it is flushed twice each week.

Collections in the business district are made twice daily, there being day and night service, including Sundays. The Garbage Department operates every day regardless of rain, extreme cold weather or holidays.

As result of the 1935 flood, the Garbage Department collected approximately 600 tons of refuse in the emergency. During this time 40 per cent of all city Garbage and Scavenger Department employees, including the office force, worked day and night.

W. S. Webb,
Superintendent, Garbage and Scavenger Departments.

Begin Now to Build Up Your Fire Alarm Box Distribution

Every city should follow a planned annual program for maintaining adequate fire alarm box distribution by purchasing a definite number of fire alarm boxes each year.

To accomplish this, every fire chief should first make a survey of his existing system by plotting out the locations of his present boxes on a map of his city and also marking those locations where additional boxes are urgently needed. A check up on all obsolete boxes should also be made. Then a definite plan should be established to replace a certain number of obsolete boxes and add a few new ones each year so that at the end of a ten-year period, the entire system will contain an adequate number of boxes on the streets—all of a modern type.

After your needs have been determined in this manner, you should put in your next budget, a figure large enough to take care of the purchase and installation of these boxes. Many cities have suffered during the past few years because of reduced appropriations; but now with business and tax collections greatly improved, you should lay definite plans to start building up your fire alarm box distribution again on a planned basis, so that the efficiency of your fire department will not become too seriously impaired.

We have an interesting booklet "Planning Fire Alarm Box Distribution for Fifty Years," that should be a real aid to you in planning your fire alarm requirements. A copy will be sent to you on request.

THE GAMEWELL COMPANY

NEWTON, MASSACHUSETTS

"A Box A Block"

Public Safety

Topeka's Enclosed Fire Truck Saves Farm Home on First Run

TOPEKA'S new enclosed fire truck was placed in service just in time to save a farm home three miles south of town from complete destruction. Firemen from a nearer fire station had exhausted their small chemical supply when the enclosed truck, making its initial run, arrived with its 525 gallons of water. The entire roof was in flames, but the firemen soon brought the fire under control and saved the home.

The new truck was designed by William Cauker, Fire Chief, and Charles Lynn, the Department's master mechanic, especially to answer alarms in the rural districts and in the residential section of Topeka. Need for the truck arose when the city of Topeka entered into contracts with several townships to provide rural fire protection. Apparatus already in service in the city was unsatisfactory and ineffective in rural alarms.

The truck has a specially designed body to provide shelter for firemen answering alarms in cold weather, and will keep the hose dry while answering alarms in the rain. Fire alarms during a rain are never welcome, since it is frequently necessary to unload the entire supply of hose and dry it. The enclosed body solves this problem. The body even has a sliding door at the back, and firemen can ride in comfort and safety. There are folding seats in the back of the truck, and the front seat is wide enough for three firemen.

Fire department officials declare that the new truck is one of the most efficient fire-extinguishing pieces of equipment yet built. With its equipment, a fair-sized residence fire may be extinguished without help from other companies. It carries a tank, 12 feet long, 39 inches wide, and 22 inches high. Four lines of hose may be run from the pump, two 1½-inch lines, and two ¾-inch lines. Enough pressure is generated to throw water 90 to 100 feet into the air. The large water tank makes the truck especially efficient in suburban areas beyond water-main service.

FAST WORK

Firemen on this trick can go into action within 30 seconds after they stop at the fire. In a preliminary test, the operator had water coming from the hose in 16 seconds. The tank has an automatic valve invented by the master mechanic to speed up the evolution. As long as the water is running, the valve is open and water is circulating in the pump. The instant the water is cut off, the valve, operated by a vacuum from the motor, automatically closes.

The truck carries 600 feet of 1½-inch hose, 500 feet of ¾-inch hose, 100 feet of 2½-inch hose, 52 feet of ladders, a dozen buckets, a first-aid kit, and other paraphernalia. It has 30 feet of suction hose, and the pump may draft from a well, cistern, tank or stream. The truck fully loaded weighs 8 tons.

The body was built by a commercial body works, but all other work on the equipment was done in the Fire Department shop. An International truck chassis was purchased, and the Department made several mechanical changes in it to adapt it to fire department service. For example, the radiator was equipped with a by-pass to circulate water through the motor and radiator when the pump is being used. A heater directs heat to the windshield to keep ice and snow from obstructing the driver's vision.

A special school of instruction was held, and all firemen were shown how to use the equipment on the truck most efficiently.

It is estimated that the truck will be capable of extinguishing 90 per cent of the fires in the residential district, and, in addition to making all rural runs, it will respond to all residential fires in the west half of the city.

O. J. SWANDER,
Engineer, Kansas Inspection Bureau, Topeka, Kans.

Motives for Manslaughter

LAST year in New York City there were 370 murder cases, compared with 359 in 1934. Although Police Commissioner Lewis J. Valentine reported practical elimination of commercial prostitution and gambling, analysis of motives shows that 17 cases had to do with gambling and two with vice disputes. These were the reported motives:

	1935	1934
Criminal dispute or revenge	28	22
Gambling dispute	17	13
Narcotic dispute	—	1
Prostitution dispute	2	—
Marital and passion	78	88
Dispute—debt or business	19	41
Dispute—drunken	11	6
Altercation—various causes	93	83
Commission of a felony, robbery	40	38
Revenge	15	11
Indecent assault	5	3
To defraud insurance company	1	—
Unknown	61	53
Total	370	359

"Intersection Ratings"

AN index or rating that can be used as a basis of comparing a group of intersections for the purpose of signalization has been developed mathematically by John T. Gibala, Assistant Engineer in the office of the Chief Engineer of the Police Department, New York City. The calculations give consideration to vehicle vs. vehicle, left turns, vehicular speed, pedestrians vs. vehicles. The final result is a rather long equation, but one that is simple to use if the data are available. Mr. Gibala has worked out all the intermediate steps and will send a copy of the problem to those who request it. "This manner of rating," he says, "has already served a useful purpose in the preparation of a priority list comprising over 700 intersections."

Over 200 Ultra-High Police-Radio Stations

MORE than 200 municipalities are now operating ultra-high-frequency police-radio stations, on 30,100, 33,100, 37,100 and 40,100 kilocycles. All stations operating at these frequencies are classed by the Communications Commission as experimental stations, since adjustments may have to be made later to suit the degree of crowding and interference that may occur on this band. This frequency corresponds to about 9.5 meters, as compared with 120 meters for conventional police-radio operation and 200 meters for the regular broadcast band. Of the 218 or so ultra-high stations, 84 are two-way.

The following is quoted from a letter received from the Federal Communications Commission dated March 16:

"Municipalities interested in either replacing existing equipment or installing new stations should purchase only equipment constructed in accordance with the most modern engineering standards. Consideration should be given to selectivity of receivers, frequency stability of both the receivers and transmitters, and ruggedness of apparatus, rather than costs. Many municipalities have found that the high obsolescence introduced by the purchase of cheaper equipment more than balances the difference in the initial cost."

Two-Way Radio on Ambulance

A CITY ambulance in Evanston, Ill., will be equipped with two-way radio at the same time that ten prowl cars are being equipped by General Electric engineers. With its 15-watt transmitter, the ambulance can thus send word ahead of the nature of the patient's needs.

Traffic Death Rate

TRAFFIC death rate per 100,000 population has been about 22.5 this year against an earlier rate of 24.3—a drop of 7 per cent and in the direction of the objective of the National Safety Council's vigorous effort. Lowest and highest rates are 5.4 in San Francisco and 65.6 in Camden, says the Bureau of the Census.

HARD FACTS ON THE SHOW-DOWN:

"On only 2 gallons of cheap fuel per hour," reports one owner, "my 'Caterpillar' Twenty-Two does heavy-duty work, lugging a heavy load on grades measuring 55 to 80%."

The "Caterpillar" SHOW-DOWN brings you the correct tractor for your work—4 sizes of Diesel and 5 of Spark-Ignition Tractors are available.

The driver of this "Caterpillar" Twenty-Two Tractor says it is the b outfit he has used in his 23 years' experience. It handles easily. It conqu steep hills, soft ground, heavy loads—thanks to its non-skid traction a sure control. It's versatile—does roadwork, dirt-moving, hauling, refu handling, and other jobs equally well. And it is first choice for its ow because of the low operating costs that are teamed with its dependa performance—fuel costs at a new low, maintenance costs down to ro bottom—the same qualities that make it the best buy for tax dollars. G the whole "Caterpillar" SHOW-DOWN from a dealer. Caterpillar Trac Co., Peoria, Illinois, U. S. A.

CATERPILLAR

REG. U. S. PAT. OFF.

Streets: Maintenance and Accounting

Major Engineering Projects in Cumberland, Md., in 1935

DURING 1935, the city of Cumberland, Md., spent over $600,000 on improvements alone, including:

39,400 ft. of sanitary sewers ranging from 4 in. to 54 in.	$432,768.75
2,535 ft. of storm sewers ranging from 54 in. to 84 in.	42,414.46
2,709 ft. of cast iron water mains ranging from 6 in. to 16 in.	12,107.00
Street resurfacing with black top material	39,457.25
Municipal airport grading	48,000.00
Municipal playground grading	24,398.00
Brick stack at incinerator	870.91
	$600,016.37

The city still has four major projects to be completed, which include the sewering of the Lindnerville and Bedford Road sections recently annexed to the city of Cumberland, an outfall sewer 3 miles long leading from Lindnerville to the Potomac River, ranging in size from 18- to 27-inch, and a 16-inch water line 2,500 feet long connecting the present Bedford Street line to the main line of the city reservoir.

When the sewer projects are completed, the city of Cumberland will be 100 per cent sewered and all the streams running through the city will have been cleared up and all sewage removed. Sewage is now deposited at one central point three miles below the city, where the construction of a sewage-treatment plant is anticipated.

All the work has been done by the city except one job which was let out by contract and is now finished. The remainder of the work is being carried out by the city under the direction of the Street Commissioner and the City Engineer. As soon as the weather permits, the city will complete the grading at the municipal airport and the municipal playground, and will also resurface several streets which were started before bad weather set in.

HENRY W. SCHAIDT,
City Engineer.

Portland Cement Mixed with Clay to Stabilize Soil Bases

RESEARCH in the use of portland cement for stabilizing soil bases has recently been performed in South Carolina. During 1933 and 1934 seven sections of road, varying in length from 500 to 1,000 feet, were constructed in soil whose natural clay content ranged between 21 and 54 per cent. All were covered with bituminous wearing surfaces. The smallest amount of cement used was 1½ sacks per cubic yard of treated material. There was no indication, however, that this was the minimum amount which could be used. The quantities were estimated for a compacted thickness of 6 inches of base course, although cores drilled from the experimental sections did not show that stabilization extended to this depth.

Experimental work in the treatment of soils with bituminous materials has been conducted recently in various parts of the country. During the past five years, plant-mix and road-mix jobs have been constructed utilizing the different grades of tars, road oils, and bituminous emulsions. In addition to the highways which have been so treated, airplane landing fields also have been stabilized with bituminous material.

To keep stabilized soil roads in the low-cost field, special attention must be directed toward simple operations and toward conditions and materials.

—From a paper on "Stabilized Soil Roads" by C. A. HOGENTOGLER, and E. A. WILLIS, Senior Highway Engineer and Associate Highway Engineer, respectively, U. S. Bureau of Public Roads, published in *Civil Engineering* for December, 1935, page 759.

Engineering Cost Accounting and Budget Publicity

OPERATING a large municipal department on a reduced budget is not an easy matter. Unless careful checks are made at regular intervals, the budget can easily be exceeded, making it necessary to secure supplementary funds or to lay off employees. In order to secure the best results, it is advisable for engineer-officials to have a knowledge of accounting as well as engineering.

In St. Louis, reports are submitted to the Director of Streets and Sewers about the fifth of each month covering all sectional activities of the previous month. These reports show monthly expenditures for labor and material. Whenever a quota is being exceeded, the condition can be corrected by putting on the brakes before things become serious.

A decided improvement has been made in compiling departmental records, and the various clerks deserve commendation for their cooperation along these lines. There is room for further improvement, which will no doubt be brought about in the near future.

It required the combined efforts of the cost accountant, the efficiency engineer, two assistants and numerous clerks to prepare the first departmental inventory. This work took nearly two months and, as regular routine duties had to suffer, it is doubtful whether the work can be undertaken again without additional forces.

That the Department of Streets and Sewers has functioned efficiently during the past two years speaks well for the careful check made on expenditures. Notwithstanding a greatly reduced budget, there has been no need to lay off any employees. Funds had to be used with the utmost care, and every possible advantage taken of economies. It was largely through the hearty cooperation of all employees that full activities were carried on. This was accomplished without any need for supplementary funds, and at the end of the fiscal year a substantial sum was turned back to General Revenue.

The Director must be intimately acquainted with the details of all departmental activities in order to aid in the preparation of the budget. A preliminary set-up is made and submitted, about the end of each calendar year, to the Budget Director, who, after estimating the receipts of the coming fiscal year, cuts the various departmental budgets to suit the city purse. Later on, conferences are held between the Budget Director and various departmental heads. At these conferences certain essential items may be reinstated in the budget and others dropped. About this time newspaper publicity starts and articles appear indicating that drastic cuts may be necessary in order to avoid a deficit. While the taxpayer is entitled to know what is going on, how about the large number of city employees earning a meager wage on which they have to support a large family? This publicity causes no end of worry as to whether or not a reduction in forces will take place, and the worry in turn impairs the character of the men's work. Still later, when budget discussions take place before the Board of Estimate and Apportionment and the Ways and Means Committee of the Board of Aldermen, the worry on the part of city employees becomes more acute. Thus a further reduction in efficiency. This situation continues until the budget is finally approved by the Board of Aldermen, and each year—but more particularly during periods of business depression—the city loses money for several months through impaired efficiency. The employees are not to blame for this condition. They can't help worrying about being unable to support their families. Possibly the solution lies in tempering the publicity given out during this period.

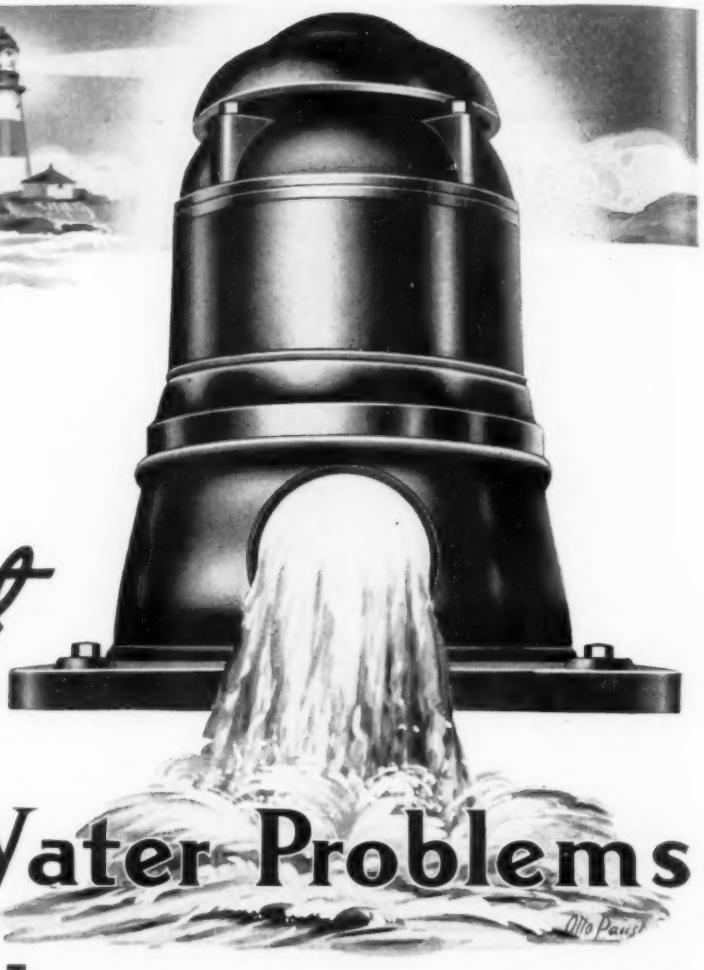
FRANK J. MCDEVITT,
Director of Streets and Sewers.

Street Maintenance in San Mateo, Calif.

OUR streets are in fair condition, but some maintenance work is needed at present. Owing to the lack of funds for the last three years, our only maintenance has been low-cost repairs with asphalt surfacing or emulsified asphalt. No relief labor has been used in this work. We plan on spending about twice as much money in 1936 as in the past. We also have an additional ¼-cent of gas tax funds from the state to be used on our major streets.

E. P. WILSEY,
City Engineer.

Let's Talk About



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California Municipal Water Supplies

By CHARLES GILMAN HYDE
Professor of Sanitary Engineering, University of California, Berkeley, Calif.

CALIFORNIA is a state of many anomalies, climatic, ethnic, and others. In comparison with other portions of the United States, we find here the highest and the lowest spots; areas which are assuredly among the hottest, and others which are among the coldest; districts which are rarely visited by frosts, and others which are so uniformly cold and with such short seasons that only the hardier grains can be grown; portions so dry that rain is an extraordinary event, and others with an annual rainfall perhaps the greatest in continental United States, or closely such. In general, the climate is marked by a wet season occurring normally between October and March, and a dry season extending from April to September. Over most of the state the bulk of the rainfall occurs during the months of November to February, inclusive. Marked variations in the depth of precipitation obtain with changes in altitude and geographical location.

Precipitation in the higher portions of the Sierra Nevada Mountains occurs largely in the form of snow. The snow blanket, serving as a reservoir, ordinarily maintains stream flow until well into the summer. It is obvious that under such climatic conditions stream flow must be subject to great fluctuations, and that impounding reservoir storage must be essential to any considerable degree of development and utilization of surface water resources, whether for purposes of public water supply, of irrigation, or of water power.

The great valleys and coastal plains of California are in general composed of deep alluvial deposits. Under natural conditions these were filled, sometimes to the point of overflowing, with ground water. Municipal and irrigation water supplies have been taken from these underground reservoirs to such an extent that in many, if not most, of the highly developed areas the demand has become greater than the long-term supply or rate of replenishment. In consequence, water levels in wells have been continuously dropping until, in certain districts, critical conditions are being reached. The deeper waters are apt to be more heavily mineralized and are of course more costly to develop and pump.

With extremes in precipitation and in temperature, such as have been noted, and in general with long dry seasons obtaining throughout the more densely inhabited sections of the state, it is natural to find wide variations in water demands as between the rainy and the dry seasons. Irrigation of lawns, gardens and parks is therefore a more important item in municipal water service in arid and semi-arid regions than it is in areas with a larger and more uniformly distributed precipitation.

The cities of California are not as yet heavily industrialized, and the demand for water in that field is relatively small. The canning industry does, however, make significant demands upon the water supply in some communities.

Despite the planned brevity of this discussion, certain controlling conditions have thus been described and certain statistical data are herein later presented with a view to furnishing somewhat of a background for a more competent interpretation of the problems, methods, and specific facts concerning the municipal water supplies of California.

For the most part the statistical data presented herein apply to the years 1930-32. They have been compiled from a photostati.

THE WELL-KNOWN WATER TEMPLE AT SUNOL, CALIF., BUILT BY THE SPRING VALLEY WATER COMPANY SOME 25 YEARS AGO

In a tiled basin far beneath the surface of the ground the filtered waters from the Sunol gravels meet the artesian well waters from Livermore Valley. This is one of the early attempts to beautify water-works structures in the West

SOUTH END OF THE 7,096-FOOT JAWBONE INVERTED SIPHON OF THE LOS ANGELES AQUEDUCT DURING ITS CONSTRUCTION IN 1912-13
It varies in diameter from 10 feet at its upper end to 7 feet 6 inches at its lowest point

edition of a report of the Bureau of Sanitary Engineering, California State Department of Public Health, C. G. Gillespie, Director and Chief Engineer, entitled "Water Works Statistics—Cities, Towns and Sanitary Districts in California, as Surveyed in 1930, 1931 and 1932."

Because of conditions already described, it is a relatively difficult and expensive matter, in many parts of the state, to secure a domestic water supply as an individual undertaking. Thus it would appear that in contrast with some other states an unusually large percentage of communities in California, including the very smallest, are provided with a public water supply.

The available information indicates that 311 places or districts are publicly supplied with water. Of that number, 274 are cities or other incorporated places, and 37 are sanitary districts. The population resident in 1930 in these 311 places was 4,327,000, or somewhat over 76 per cent of the entire population of the state and somewhat more than the population resident in all incorporated places.

Number of Water-Supply Systems

In a considerable number of cases a group of communities is supplied by a single system of water works. A notable example is the group of ten cities and sanitary districts on the east side of San Francisco Bay supplied by the East Bay Municipal Utility District. Similarly, the Marin Municipal Water District supplies at least ten independent communities from its system of works. There are a few cases where from two to four independent systems supply a single community. An unusual example is Maywood, a place of about 6,800 inhabitants, supplied by three mutual water companies. The city of Los Angeles is supplied by a number of independent water systems. It appears that the 311 incorporated places and districts provided with public water supplies, as noted above, are supplied by 282 systems of works.

Ownership and Development

Of the 311 places and districts in question, 190, or 61 per cent, are supplied from works publicly owned; and 113, or 36 per cent, from works under private ownership. Of the last number, 107 are owned by companies or corporations and 6 by individuals. Eight places or districts are supplied by two or more systems of works, one or more in each instance being publicly owned and one or more privately owned.

There is a large number of small communities in California located in the great valleys and coastal plains at considerable distances from perennial streams of suitable character for water-supply purposes. For such places a ground water rather than a surface water is the more available and logical source of supply.

Of the 311 places or districts having public water supplies, 167, or 54 per cent, are supplied by wells. In addition, 10 are supplied by springs and 4 by combinations of wells, springs and tunnels. Fifty-six places or districts (18 per cent), including a majority of the largest cities, are supplied by both surface and ground water. Seventy-four communities, or nearly 24 per cent, are supplied exclusively by surface waters.

Water Consumption

As already noted, a relatively wide seasonal range in water consumption is to be expected in regions which are semi-arid in character and where there are well-defined wet and dry periods. Figures of average use of water in the communities of the state in recent years are not immediately available, but statistics showing the reported range in consumption have been gathered by the State Bureau of Sanitary Engineering. These have been studied by the author in connection with the use of meters. The results are presented in the following table:

WATER CONSUMPTION IN CALIFORNIA COMMUNITIES AND DISTRICTS WITH VARIOUS STATED PERCENTAGES OF METERED SERVICES

Per Cent Services Metered	No. of Places	1930 Population	Average Population per Place	Range in Daily Consumption Total—MGD Min.	Total—MGD Max.	Gals. per Inhabitant Min.	Gals. per Inhabitant Max.	Ratio Max. to Min.
95–100	188	3,815,100	20,300	325.2	629.7	85.	165.	1.9
75– 94	32	117,000	3,700	14.7	36.8	125.	315.	2.5
50– 74	14	34,500	2,500	7.0	14.9	205.	430.	2.1
25– 49	7	44,000	6,300	7.4	24.7	165.	560.	3.4
Few-24	22	247,600	11,300	39.8	130.4	160.	525.	3.3
None	22	26,100	1,200	8.4	20.9	320.	800.	2.5
No information	26	42,600	1,600	....	...	...	...	...
Totals and Averages	311	4,326,900	13,900	402.5	857.4	95*	200*	2.1

NOTE:—Average percentage of services metered in 285 places for which information was available = 91.3.
*Weighted averages.

It is interesting to observe that the range in water consumption per inhabitant for communities whose services were practically all metered was smaller, and the actual demand per inhabitant was very much less, than in the other groups of places. The actual consumption per inhabitant was far higher in places with no meters than in those which had some meters, even though few.

Studies of water consumption in the year 1914 in 108 California communities were made by the author to determine the average daily per inhabitant demand for the entire

group and according to the percentages of services metered. The daily per inhabitant consumption for the whole group, figured as a direct average, was 155 gallons and, calculated as a weighted mean, was 112 gallons. The average percentages of services metered was 63.

Use and Effect of Meters

Information with respect to meters on services is available for 308 of the 311 places and districts in California provided with public water supplies. The total number of taps in these 308 communities, for the period surveyed, was 1,159,000, and the total number of meters in service was approximately 1,058,000. In other words, 91.3 per cent of all water services in the state were found to be provided with meters. It is estimated that meters were serving about 93 per cent of the population actually supplied with public water.

The general effect of meters upon the demand for water has been referred to and exhibited by the figures in the table. The most striking facts brought out by the present study are that nearly 90 per cent of the population living in communities having public water supplies is resident in places wherein from 95 to 100 per cent of all services are metered, and that 91.3 per cent of all services in the state are provided with meters.

Water Treatment in California

There are 35 filtration plants in California having an aggregate rated capacity of about 260 million gallons per 24 hours. There are three slow sand plants. The remainder are rapid sand. Of the latter, 19 are of the gravity type and 13 of the pressure type. These plants supply all or a portion of the water consumed in 40 communities. The majority of these plants, namely 26, have been installed as a measure of hygienic safety. Twenty-three plants function to remove turbidity, 23 to remove algae, 4 to remove fungus growths from well water supplies, 4 to remove or reduce color, and 2 to remove iron. Four plants involve aeration to remove hydrogen sulphide from well waters.

Coagulated subsidence, without subsequent filtration, is employed for the clarification of the entire supply of five towns, and in addition a portion of the supply furnished to ten communities and sanitary districts by the Marin Municipal Water District is so treated.

The supplies furnished to 132 communities and sanitary districts are chlorinated in whole or in part. Chlorination is applied in 72 cases to surface waters only, in 20 cases to ground waters only, and in 40 cases to mixed surface and ground water supplies. In a number of instances ammonia is also applied to produce chloramine. Six well water supplies are being super-chlorinated and later dechlorinated with sulphur dioxide.

Some Notable Existing Water Works

Many of the water works in California have features of great interest whose recital would be well worth while. Such features represent real contributions to the science and art of water-supply engineering.

Among the projects and works which ought to be mentioned in this connection are at least the following: the dams and storage reservoir system of San Diego; the great Los Angeles aqueduct; the ground water development in lower San Fernando Valley and elsewhere; and the Mono Basin resources now undergoing development for the city of Los Angeles; the Pasadena well and reservoir systems; the reservoir and conduit in tunnel for the supply of Santa Barbara; the Peninsular works developed in the earlier years for the supply of San Francisco and the later developments of the Pleasanton well system; the Sunol filter beds and Calaveras reservoir in Alameda County; and still more recently the Hetch Hetchy and Lake Eleanor supply and aqueduct works; the local storage reservoirs and notable filtration plants of the East Bay (Bay of San Francisco) cities and the more recent Mokelumne River storage works and aqueduct system of the East Bay Municipal Utility District; the reservoir system and works of the

LA CIENEGA WATER SOFTENING, IRON AND HYDROGEN SULPHIDE REMOVAL PLANT OF BEVERLY HILLS, CALIF.

Marin Municipal Water District; the coagulation and filtration works of Sacramento; the extensive ground water supplies of Bakersfield, Fresno, Modesto, Stockton and other places.

The Metropolitan District Supply of Southern California

The proposed Colorado aqueduct works for the supply of thirteen cities now comprising the Metropolitan Water District of Southern California is the most gigantic domestic water-supply undertaking, in scale, capacity and cost, that has ever been attempted at one time by man. The District embraces portions of Los Angeles and Orange Counties. In 1930 the population of the member cities was 1,666,000.

The ground water resources of the region have been drawn upon beyond their utmost safe yield, and for years the levels have been receding, until over large areas salt water encroachment has ruined the supply. The ultimate capacity of the Owens River and Mono Basin works, 450 million gallons daily through the Los Angeles aqueduct, is inadequate to meet the future needs of Los Angeles City. Similarly, all other surface sources, utilized or available in the region, are wholly incapable of meeting future demands. For these reasons the development and use of Colorado River water became the logical next steps in the solution of the water-supply problem of this region. Indeed, Colorado River is the only source of adequate supply available.

The construction of Boulder Canyon dam has made the regulation of Colorado River possible and insures the sufficiency of both water and power for the Colorado aqueduct project. This magnificent concrete structure has been built to the unprecedented height of 727 feet from foundation to crest and is creating a reservoir to hold, when full, the stupendous volume of 10,000 billion gallons. It offers the opportunity to develop hydroelectric power to the extent of from 4 to 6 billion kilowatt-hours per year.

The Colorado aqueduct project, whose construction was begun in 1932, contemplates the erection of a large dam across Colorado River just below the mouth of Bill Williams River, 16 miles north of Parker, Ariz.; the building of 242.3 miles of aqueduct works (tunnels, cut-and-cover aqueduct, open canals, inverted siphons, force mains, etc.); and the construction of Cajalco reservoir, a terminal storage basin, located ten miles south of Riverside, whence distribution pipe lines will lead to various parts of the water district.

The ultimate daily capacity of these projected works will be about 1,600 second-feet, or 1,030 million gallons. Certain major items, such as the Parker dam, the intakes, tunnels, main canal and cut-and-cover aqueduct sections, and the pumping-plant structures, will be built to full capacity at the outset. Pumping equipment, pipe lines and similar features, which readily can be duplicated or enlarged in the future, will be constructed to have an initial capacity of 600 second-feet, or 390 million gallons per day. The initial cost of the enterprise is estimated to be $219,000,000, and the ultimate cost $284,000,000.

Parker dam will raise the water in Colorado River 72 feet or to El. 450. Cajalco reservoir, at the terminus of the aqueduct, may have an ultimate elevation of 1,405 feet, making a net static pumping lift of 955 feet. There will be five pumping lifts of unexampled heights, considering the volume to be raised. These will aggregate 1,617 feet, the smallest lift being 147 feet and the largest 440 feet. The hydraulic grade line of the 242.3 miles of conduits will have a fall of 662 feet, or approximately 2.7 feet per mile as an average value. The highest elevation attained on route will be 1,807 feet. The estimated annual pumping costs range from $1,800,000 for the first year of operation to about $4,000,000 for the fiftieth year, with power costs figured respectively at 1.67 and 1.69 mills per kilowatt-hour. To raise 1,600 second-feet of water through a static plus dynamic head of, say, 1,800 feet will require some 385,000 horsepower on the shafts of centrifugal pumps having a working efficiency of 85 per cent.

The aqueduct will embrace approximately 92 miles of tunnels, 55 miles of cut-and-cover section, 62 miles of open lined canal, 29 miles of inverted siphons, 2 miles of force mains and ditches, and 2 miles of passage through reservoirs.

Cajalco reservoir will be created by a rolled fill earth dam initially 170 feet in height and perhaps ultimately 245 feet high. The initial capacity will be about 20 billion gallons. The ultimate capacity can be 73 billion gallons.

The aqueduct traverses forbidding deserts and rugged mountainous areas. Before the actual work of construction of the aqueduct proper could be begun, it was necessary to build 147 miles of surfaced highway, 448 miles of high-voltage electrical power lines, 1,060 circuit miles of telephone line, and 180 miles of water-supply pipe lines with the essential wells as sources of supply and pumping equipment to deliver the water to points of use. Despite all handicaps, the work of construction has made marvelous progress. The driving of the tunnels has set new standards of speed.

California's Contributions to Water-Supply Engineering

California has made her own particular and significant contributions to water-supply engineering through her truly great engineers, through brilliantly conceived and executed projects, and through many new and original devices and methods. Such men as Hermann Schussler, A. Chabot, F. E. Brown, J. M. Howells, James D. Schuyler, William Mulholland, H. N. Savage, Arthur L. Adams, C. E. Grunsky, M. M. O'Shaughnessy, G. A. Elliott, and others will long be remembered because of the new or better things that they have conceived and accomplished in the field of public water supplies.

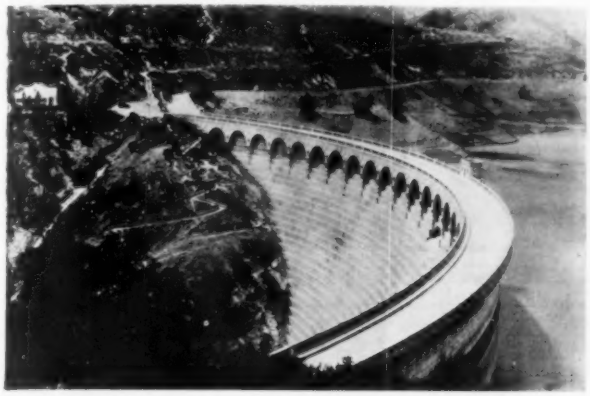
California has contributed the stove-pipe casing and the so-called California method of sinking wells. Here the first rock-fill and hydraulic-fill dams were constructed, and the first dam of the strictly pure arch type. Early, if not the first, multiple arch dams were built in California. On the Los Angeles aqueduct Mulholland constructed inverted siphons larger by far and under very much higher heads than had ever before been attempted on water-supply projects anywhere.

Other contributions have been made in the fields of deep-well pumping by air lifts, multiple-stage centrifugal pumps and reciprocating plunger pumps; to the treatment of water by aeration, coagulation, floc conditioning and sedimentation; to the hydraulics and design of slow sand and rapid sand filter underdrains; to the architecture and landscaping of water-works structures.

Sources of Water Supply for the City of Los Angeles

LOS ANGELES, CALIF., is to be the host to the American Water Works Association at its 56th Annual Convention, June 8-12. That those who attend the convention as well as those at home may see something of the beauties of the various sources of water supply for the city of Los Angeles, we are publishing at the right, and below, a group of photographs supplied through the courtesy of **H. A. Van Norman**, Chief Engineer and General Manager of Water Works, Bureau of Water Works and Supply of Los Angeles.

PARKER CREEK



MULHOLLAND DAM BEFORE BEAUTIFICATION

MULHOLLAND DAM AFTER LANDSCAPING

ENTRANCE TO ROWENA RESERVOIR

SILVER LAKE RESERVOIR

LAKE GEORGE

SAWTELLE PRESSURE BREAK

Handling 9,000 Water Accounts

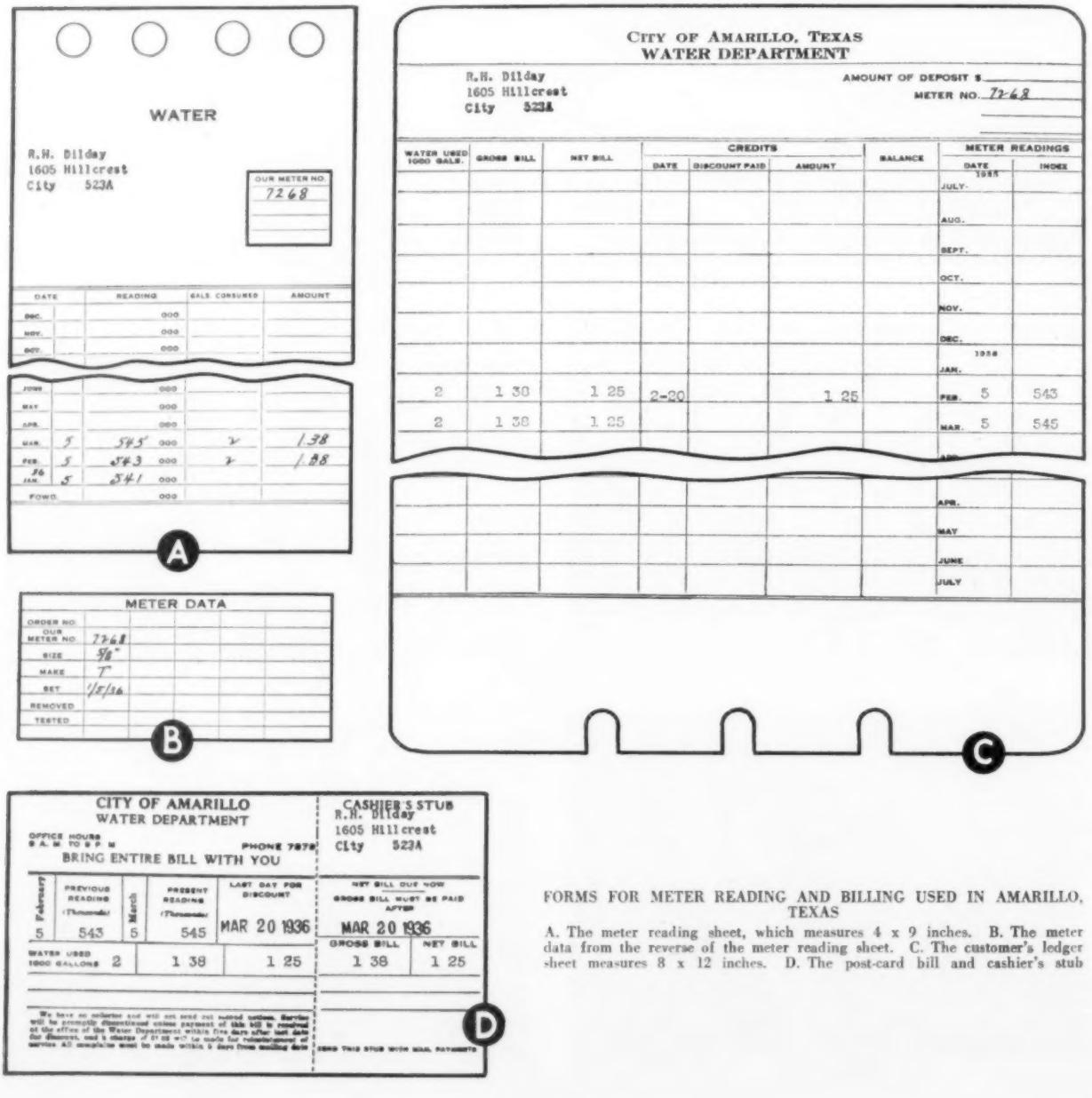
Monthly Billing Done Rapidly by Machine in City of 45,000

By N. V. MOSS
Chief Clerk, Water Department, Amarillo, Texas

THE city of Amarillo began the operation of the local water works in 1927 and now handles approximately 9,000 accounts each month, mailing the bills and collecting and posting the credits with addressing, billing and posting machines.

Meter Reading

The routine of mailing and collecting water bills starts with the meter readings. The readings are taken once each month on a meter reading sheet. The sheets have space for the continuous recording of readings for a period of 24 months. At the top of the sheet is the customer's name, street address and folio number. The sheets are arranged in the meter book numerically by folio number. The folio number is one given to each lot within the city limits, the lots being so numbered as to run consecutively as to meter location. These books, after having been read,



FORMS FOR METER READING AND BILLING USED IN AMARILLO, TEXAS

A. The meter reading sheet, which measures 4 x 9 inches. B. The meter data from the reverse of the meter reading sheet. C. The customer's ledger sheet measures 8 x 12 inches. D. The post-card bill and cashier's stub

A CORNER OF THE WATER-WORKS OFFICE, SHOWING THE BILLING MACHINES AND CUSTOMERS' LEDGERS

are turned in to the billing clerk. The billing clerk extends the amount of consumption for the current month by subtracting the previous from the current meter reading, and also puts down the amount of the bill. The book is now ready for the billing machine operator.

We are using individual customers ledger sheets, which are filed in loose-leaf form in a ledger tray. The bills are mailed on postal cards, printed to specifications in our own printing shop. These cards have space for the previous month's and the current month's meter reading, and the date of each. They also show the consumption in thousands of gallons and the amount of the gross and net bill.

The mailing list is kept on Addressograph plates filed numerically by folio number, the same as the meter sheets and individual consumers' ledger sheets. These plates show the customer's name, address and folio number. The cards are addressed by running the plates through the addressing machine, and are delivered to the billing machine operator in the same order as his meter reading sheets and customers' ledger sheets.

Billing by Machines

The billing machine operator now has his meter sheets, printed bills and customers' ledger sheets, and is ready to start billing. The data are taken from the meter sheet and posted to the customer's ledger sheet, the customer's bill, bearing his name and address, and a sales audit sheet, all in one operation by a Burroughs billing machine. The sales audit sheet is just a blank strip of paper which by use of a carbon records a duplicate of the information placed on the bill and the ledger. It is later used as a basis for the journal entry to the Consumers' Accounts receivable.

The information placed on the bill includes the date and meter reading of the previous month, the date and meter reading of the current month, the consumption in thousands of gallons, and the gross and net amounts of the bill. The machine carries the totals of all this information, so that when a group has been completed, proof of the work is available. In other words, the total of all the previous meter readings plus the total of consumption should equal the total of all the present readings. The billings are now complete, and the postal card bills are placed in the mail.

When the bills are presented for payment, they are receipted, the stub end being retained, from which the credits are posted. A Burroughs posting machine is used to post the payments to the consumers' ledger sheets. It posts the date and amount of payment.

One man operates both the billing and the posting machine. This means that he makes approximately 18,000 entries to the customers' ledgers each month. In addition to the machine work, he routes his own stubs before posting the cash payments and puts on by hand any arrears which may be unpaid at the time of the billing.

The city is divided into districts, each district having a different meter-reading date. By this arrangement bills are going out almost every day, and either the billing machine or the posting machine is in use almost constantly.

PWA Has Built 2,000 Water Works and Related Projects

THE Federal Emergency Administration of Public Works has announced that approximately 2,000 water works and related projects have been made possible in towns and cities of 48 states through PWA financing. Of these 1,696 were water works and immediately related projects, for which $169,631,820 in loans and grants was allotted. There is no easy method of determining the total amount of construction thus made possible, although the Engineering Division estimates it at $247,000,000.

In devoting 25 per cent of its non-Federal program to this phase of public improvements, PWA made it possible for communities to construct complete water-works systems, plants for the treatment and distribution of water, supplies from wells, springs, rivers and lakes, filtration plants, softening plants, general chemical treatment, aeration, chlorination, dams, intakes, reservoirs, distribution piping systems, fire protection, meters, elevated tower storage tanks, industrial water supply, revamping present treatment plants, extension to distribution systems, sewage systems and disposal plants, power plants, and so on.

This construction program has been of great advantage because it made possible work for contractors and their supervisory staffs when communities were prevented by lack of funds from continuing their civic improvements. It permitted the utilization of construction equipment which would otherwise have continued idle with losses to the owners due to depreciation and carrying charges. It also furnished work for manufacturers of equipment and supplies, and it bolstered activity in the engineering and architectural professions.

Repaving a Pittsburgh Bridge

By HENRY D. JOHNSON, JR.
Chief Engineer, Department of Public Works, Pittsburgh, Pa.

THE necessity for keeping the Manchester Bridge in the city of Pittsburgh, Pa., open to traffic largely dictated the choice of vitrified vertical fiber brick as a paving surface. This bridge connects the lower end of the business district of Pittsburgh with the light manufacturing and residential North Side district, which was formerly the city of Allegheny. It has a normal traffic volume of 13,322 vehicles per day and one street-car line. In addition to connecting the business district with the North Side district, it serves as an important connection to those areas lying to the south side of the Ohio and Monongahela Rivers which are served by the Point Bridge.

Earlier Paving Surfaces

The Manchester Bridge was erected in 1912 but, owing to financial difficulties, was not opened to traffic until 1914. It had originally been paved with wooden blocks on a concrete base. The original concrete mix was 1:3:6, and, as was customary at that time, was mixed with a large quantity of mixing water, from 7 to 9 gallons per sack. This weak concrete base began to show failure as early as 1927, at which time the maintenance forces of the city removed the wood block paving from the two flanks and replaced it with sheet asphalt. This sheet asphalt surfacing, as well as the wood block remaining in the street-car area, was highly unsatisfactory from the standpoint of skidding, and innumerable accidents occurred on this bridge during wet or icy weather.

Choice of New Pavement

In choosing a new pavement serious consideration had to be given to the non-skid qualities of the wearing surface. The Department of Public Works felt that the only choice lay between a concrete pavement and a modern brick pavement. Because of the existence of the street-car tracks and the necessity for paving to the level of the top of the rails, a one-course concrete pavement was definitely ruled out, for any failure of the wearing surface would mean the complete replacement of all the concrete. This is unduly expensive, since the contour of the roadway varies from 4½ inches as a minimum thickness at the curbs to 11 inches as a maximum depth at the crown, the average depth at the crown being practically 10 inches.

The selection of a two-course concrete pavement seemed inadvisable because, on account of the necessity of keeping the bridge open to traffic, it was felt the constant vibration occasioned by traffic might prevent a proper bond between the top and bottom courses. The possibility of the use of plain wire-cut vertical fiber brick was then investigated.

A study was made of the brick of this type, especially the de-aired brick which was used on the repaving of Chestnut Street between 5th and 13th streets in Philadelphia. The excellent results obtained in Philadelphia commended the brick to the engineers of this department, and further studies were made. It was finally decided to select a 3-inch vitrified vertical fiber paving brick with standard lugs, and to use a ¾-inch bituminous mastic cushion. The brick used conformed substantially to the recommended standard specifications for vitrified brick pavement of the American Society of Municipal Engineers. They were 4 inches in width, 8½ inches in length, and 3 inches in depth, having two lugs on one side which would project not less than ⅛-inch nor more than ¼-inch from the body of the brick. The brick also had non-continuous vertical bar lugs on each end which were non-meshing.

Permission was granted for the testing of this brick at the factory, and most of the brick used on the Manchester Bridge were so tested. Some difficulty was experienced in obtaining brick for this job, since the city of Pittsburgh specifications require that the abrasion loss shall not exceed an average of 22 per cent, nor shall any one of three samples show a loss in excess of 24 per cent, also because the city of Pittsburgh requires the contractor to furnish a bond to agree to maintain the pavement for five years—an unusual requirement, which is quoted:

"The contractor shall replace any and all defective brick surfacing not caused by ordinary wear and tear, that is due to defective workmanship or material, and specifically he shall take up and replace any and all brick that may be broken, raveled or spalled, after written notice from the director so to do. Such replacement shall be made by the contractor as often as ordered by the director. All materials and workmanship employed in making repairs shall conform in all respects to the requirements hereinbefore specified, and shall at all times be subject to the approval of the director. If, prior to the expiration of the guarantee period, wherever the concrete foundation is found to be defective, the entire pavement, including the concrete foundation, shall be taken up and relaid. Any brick which becomes soft, unsound, broken, or distintegrated, shall be replaced with new brick. Wherever the surface of the pavement becomes uneven on account of defective material, or by wear of the brick, or by settlement of the pavement, or any other causes, and shows a variation of ¼-inch or more, from the general surface of the pavement as determined by a 4-foot straightedge placed in any position on the surface of the pavement, the contractor shall remove the brick and re-lay the same with sound materials to the proper crown and grade."

Specifications for bituminous material for mastic bed conformed to the American Society of Municipal Engineers' specifications previously mentioned.

New Base and Surface Laid

After the contract was let and upon notification by the director, the contractor removed the old paving materials from the west flank of the bridge, that is, between the west rail of the west track and the curb, and poured a portland cement concrete base with high early strength cement and proportioned in a ratio of 94 pounds of cement to 540 pounds of surface dry aggregate, the aggregate being proportioned between fine and coarse so as to secure, in the opinion of the Department, that combination which would be most dense, strong and serviceable. Although the specifications permitted the use of as much as 6 gallons of water per sack of cement, including water in the aggregates, the average total water used was only 5⅛ gallons. The concrete base was screeded and floated so that there would be a reasonably smooth surface, although no belting nor brooming was required.

As soon as this base was poured, and at the end of approximately 48 hours, paving started by spreading the

mastic cushion to a depth slightly more than ¾-inch and screeding it to a smooth and uniform contour. The brick were then laid, culled, rolled, reculled and relaid. After the brick were laid down, properly rolled and accepted by the inspector, the surface was given a spray coat of whitewash, and joint filler which conformed to the specifications of the American Society of Municipal Engineers was poured on the surface and into the joints. As soon as this paving was completed and the joints poured, it was opened to traffic and the above procedure was repeated for the east or up-stream flank and later for the street-car area.

Non-Skid Surface

The paving is exceptionally pleasing to the eye, has a good contour, is smooth-riding and generally satisfactory. Experiments in wet and icy weather have shown it to be less slippery than asphalt pavements and probably as skid-proof as any high-grade pavement. This work was carried out for the Department of Public Works, Leslie M. Johnston, Director, and the writer, Chief Engineer, by the M. O'Herron Company, of Pittsburgh.

The bridge is 1,091 feet long, and has a roadway width of 36 feet. The contract was completed at a cost of $22,360.05. The unit price for the brick paving was $2.55 per square yard, and for the concrete base $11.00 per cubic yard.

ACKNOWLEDGMENT.—From a paper presented before the 1936 annual meeting of the National Paving Brick Association.

Unusual Design for Elevated Storage Tank

By FRANK H. CLOUGH
City Engineer, South Pasadena, Calif.

THE problem of adequate storage capacity at a necessary elevation in a high-value residential area was solved in a recent water-supply development in the city of South Pasadena, Calif. The city realized that the standard commercial elevated tank would detract a great deal from the attractiveness of a large, highly landscaped tract of land about to be subdivided, on which it was necessary to erect the tank; therefore, considerable time was spent to get a design that would combine a structure pleasing to the eye and yet fulfilling the requirements of utility.

Herbert Powell, of the architectural firm of Marsh, Smith and Powell, worked with the city department in making the final accepted design.

Somewhat overshadowing architectural design in importance was the problem of structural stability. Thus the city had two primary objectives in the construction—stability and beauty. The earthquake hazard for this particular point was considered sufficient to design for rather heavy lateral loads, this lateral load being 20 per cent of the vertical live and dead load.

Several departures were made in the outward appearance of the tank, which was of 150,000-gallon capacity and an over-all height of 75 feet. The top and bottom of the tank were made symmetrical, being semi-parabolic in contour. Eight vertical legs were used, and their width was accentuated by adding false plates on the sides of the built-up columns. The unsightly balcony at the junction of column and tank was left off.

Owing to the heavy lateral loads, it was found necessary to go to structural diagonal members rather than the customary rods and turnbuckles. Another feature of the structure was the placing of the ring girder on the inside of the tank at the junction of column and tank. The connection of structural members and the tank to the column proved to be a troublesome and interesting phase of the work. Eccentric loads were eliminated wherever possible. Heavy wing and stiffener plates were used, especially at the junction of the column and ring girder. The footings also came in for special attention. They were sunk into a hard sandstone formation. A special fin was welded to the bottom of the column shoe. During erection the fin fitted in a recess in the concrete footing and allowed for some movement. Later it was grouted in place. This fin was in addition to two large anchor bolts and served to efficiently transmit any lateral loads that might occur.

The tank was furnished and erected by the Pittsburgh-Des Moines Steel Co.

THE NEW 150,000-GALLON SPECIALLY DESIGNED ELEVATED WATER STORAGE TANK AT SOUTH PASADENA, CALIF.

Fire-Hydrant Rentals in Pennsylvania Municipalities

Representative Charges by Private Water Companies Reported by Pennsylvania Economic Council

A VALUABLE study of fire-hydrant rentals paid by municipalities to private water companies has been made by the Pennsylvania Economic Council. The table accompanying this article contains reports from 15 cities, 68 boroughs, and 17 first-class townships. It shows the total number of hydrants, the number of hydrants per thousand people, the annual hydrant charges, and the cost per capita.

Municipal water departments less frequently charge for the service to fire hydrants, and where hydrant rentals are charged by water departments the rates are usually only nominal. The accompanying tabulation, therefore, includes only the data for municipalities served by privately operated companies.

Considerable variation in rental charges is revealed by this tabulation. In making comparisons of fire-hydrant rentals, however, it should be kept in mind that certain water companies make an additional annual charge based on the total mileage of water main of and above a certain pipe diameter where such large pipe sizes are required for fire service. Where data regarding such charges have been furnished, they are covered in the explanatory notes at the end of the table.

As it is not ordinarily practicable to measure the water used by municipalities through its fire hydrants for fire fighting and other purposes, it has become customary for privately operated water companies to make a flat charge for fire-hydrant service. Such charges represent an estimate, necessarily a somewhat arbitrary one, of the cost of the water actually to be supplied during the average year, the cost of installing and maintaining the hydrants and distribution system necessary to serve them, and the cost of maintaining the entire system ready to serve these hydrants with the water and pressure necessary for adequate fire-fighting service.

In general, the probable water consumption per fire hydrant should depend on the number of hydrants to the square mile. It appears impracticable to work out such densities on the basis of the total areas of municipalities, largely because of the large variations in the percentage of the total municipal area which is built-up territory.

As an indication of hydrant density, however, a column has been inserted in the tabulation to show the number of fire hydrants to each 1,000 persons in each municipality. Only 14 of the 97 municipalities for which the total number of hydrants is listed in the tabulation have values which do not fall within the range of from 5 to 15 hydrants per 1,000 persons. The group average for the 14 cities included amounts to 7.3 hydrants per 1,000; for the 67 boroughs, it amounts to 9.2 hydrants; and for the 16 first-class townships, it amounts to 11.1 hydrants per 1,000 persons. This group trend seems to reflect a decreasing population density as one goes from cities to townships.

FIRE-HYDRANT RENTALS IN PENNSYLVANIA MUNICIPALITIES
(Data for 15 cities, 68 boroughs, and 17 first-class townships)

Unit (Cities)	Population 1930	Total No. Hydrants	Hydrants Per 1,000	Annual Charges Per Hydrant	Annual Charges Total	Cost per Capita	
Scranton	143,433	1,018	7.1	$30.00	$30,540	$0.21	
Wilkes-Barre	86,626	485	5.6	35.00	16,975	.20	
Johnstown	66,993	392	5.8	82.88	32,500	.49	
Chester	59,164	417	7.0	40.00	16,680	.28	
Hazelton	36,765	166	4.5	25.00	4,150	.11	
Easton	34,468	294	8.5	57.38	19,265	.56	9
Sharon	25,908	328	12.7	10.00	14,437	.56	1
Pottsville	24,300	213	8.8	38.00	8,094	.33	
Butler	23,568	260	11.0	51.92*	13,500	.57	
Monessen	20,268	123	6.1	15.00	8,321	.41	
Sunbury	15,626	102	6.5	10.00	12,376	.79	1
Clairton	15,291	131	8.6	50.00	6,550**	.43	
Farrell	14,359	143	10.0	10.00	.....	...	4
Connellsville	13,290	156	11.7	32.92	5,136	.39	
Monongahela	8,675	....	....	55.00	3,960	.46	
(Boroughs)							
Norristown	35,853	241	6.7	0	0	.00	
Wilkinsburg	29,639	298	10.1	8.00	2,384	.08	
Dunmore	22,627	....	....	30.00	3,788	.17	
Pottstown	19,430	145	7.5	10.00	1,450	.07	
North Braddock	16,782	99	5.9	8.00	6,740	.40	6
Plymouth	16,543	77	4.7	20.00	1,540	.09	
Jeannette	15,126	94	6.2	9.00	10,151**	.67	7
Donora	13,905	84	6.0	57.85	4,860	.35	
Lewistown	13,357	88	6.6	44.00	3,872	.29	
Munhall	12,995	68	5.2	47.50	3,230	.25	
Berwick	12,660	90	7.1	20.00	1,800	.14	
Canonsburg	12,558	100	8.0	40.00	4,000**	.32	
Carnegie	12,497	97	7.8	47.50	4,608**	.37	
Conshohocken	10,815	70	6.5	40.00	2,800	.26	
Latrobe	10,644	114	10.7	40.00	4,560	.43	
Darby	9,899	45	4.5	40.00	1,800	.18	
Punxsutawney	9,266	95	10.2	60.00	5,700	.62	
Greenville	8,628	101	11.7	12.00	1,212	.14	
Milton	8,532	137	15.8	.....	5,000	.59	
Glassport	8,390	62	7.4	50.00	3,100	.37	
Brownsville	8,183	57	7.0	30.88*	1,760	.22	9
Kittanning	7,808	73	9.4	50.00	3,650	.47	
Rochester	7,726	95	12.3	7.00	5,105	.66	10
St. Marys	7,433	71	9.6	45.00	3,195**	.43	
Crafton	7,004	84	12.0	47.50	3,990	.57	
Scottdale	6,714	77	11.5	75.00	5,775	.86	
Lehighton	6,499	67	10.3	35.00	2,328	.36	
Pitcairn	6,317	47	7.4	8.00	.....	....	11
West View	6,028	69	11.4	42.00	2,898	.48	
Oakmont	6,027	74	12.3	40.00	2,960	.44	
Exeter	5,724	37	6.5	20.00	740	.13	
Gettysburg	5,584	59	10.6	25.00	1,475	.26	
Nazareth	5,505	44	8.0	25.00	1,050	.19	
Yeadon	5,430	52	9.6	45.00	2,340**	.43	
Brentwood	5,381	82	15.2	50.00	4,100	.76	
West York	5,381	38	7.6	60.00	2,280	.42	
Clifton Heights	5,057	31	6.1	40.00	1,240	.25	
Quakertown	4,883	75	15.4	26.51*	1,988	.41	
Marcus Hook	4,867	47	9.6	40.00	1,880	.39	
Edgewood	4,821	61	12.7	8.00	3,537	.73	8
Jenkintown	4,797	62	12.9	40.00	2,480	.52	
State College	4,450	71	16.0	20.00	710	.16	
Palmyra	4,377	46	10.5	40.00	1,840	.42	
Towanda	4,104	69	16.8	47.97	3,310	.81	12
Elizabethtown	3,940	52	13.2	26.93*	1,400	.36	
Bridgeville	3,939	47	11.9	47.50	2,233**	.57	
Norwood	3,878	34	8.8	45.00	1,530	.39	
Ingram	3,866	43	11.1	47.50	2,043**	.53	
Royersford	3,719	43	11.6	22.50	968	.26	
Wellsboro	3,643	85	23.3	17.77*	1,510	.42	
Irwin	3,443	28	8.1	9.00	2,507	.73	13
Swarthmore	3,405	52	15.3	40.00	2,080	.61	
Coplay	3,279	29	8.8	48.62*	1,443	.44	14
South Fork	3,227	21	6.5	22.50*	1,671	.52	15
East Lansdowne	3,168	14	4.4	40.00	560	.18	
Burnham	3,080	25	8.1	44.00	1,100	.36	
North Belle Vernon	3,072	27	8.8	72.00*	1,944	.63	16
Myersdale	3,065	34	11.1	33.52	1,440	.47	
Mt. Penn	3,017	43	14.2	10.00	1,000	.33	
Spring City	2,963	27	9.1	21.38*	577	.19	
Williamstown	2,958	37	12.5	20.00	740	.25	
Myerstown	2,953	28	9.5	42.85	1,200	.41	

FIRE-HYDRANT RENTALS IN PENNSYLVANIA MUNICIPALITIES

(Data for 15 cities, 68 boroughs, and 17 first-class townships)

Unit (Cities)	Population 1930	Total No. Hydrants	Hydrants Per 1,000	Annual Charges Per Hydrant	Annual Charges Total	Cost per Capita	
Millersburg	2,909	84	28.9	9.00	756	.26	
North Charleroi	2,879	18	6.3	73.60	1,325	.46	
Selinsgrove	2,797	131	46.8	25.00	1,313	.47	
Youngwood	2,783	21	7.5	9.00	189	.07	
Clark Summit	2,604	26	10.0	30.00	780	.30	
Upland	2,500	18	7.2	40.00	720	.29	

*Hydrant rate computed from total. **Total annual service charge computed.

[1] Total exceeds hydrant rental by $2,396.
[2] Total exceeds hydrant rental by $11,157.
[3] Service charge of $300 per mile of pipe line.
[4] Service charge of $420 per mile of pipe line.
[5] Service charge of $270 per mile of pipe line.
[6] Service charge of $350 per mile of pipe line.
[7] Service charge of $431 per mile of pipe line.
[8] $5,000 for system; $10 for each additional hydrant, and $200 per mile of pipe line.
[9] $35 per hydrant for first 10; $30 for each additional hydrant.
[10] Service charge of $400 per mile of pipe line.
[11] Service charge of $350 per mile of pipe line.
[12] $50 per hydrant for first 65; $15 for each additional hydrant.
[13] Service charge of $431 per mile of pipe line.
[14] $50 per hydrant for first 28; $10 for each additional hydrant; $33 for pipe line.
[15] Service charge of $425 per mile of pipe line.
[16] $80 per hydrant for first 24; $8 for each additional hydrant.
[17] $37 per hydrant for 90; $42 for each additional hydrant.
[18] $42 per hydrant for 54; $37 for each additional hydrant
[19] 7 hydrants are rent free.

FIRE-HYDRANT RENTALS IN PENNSYLVANIA MUNICIPALITIES

(Data for 15 cities, 68 boroughs, and 17 first-class townships)

Unit (Cities) (First-Class Townships)	Population 1930	Total No. Hydrants	Hydrants Per 1,000	Annual Charges Per Hydrant	Annual Charges Total	Cost per Capita	
Lower Merion	35,166	431	12.2	40.00	17,240	.49	
Abington	18,648	236	12.6	40.00	9,440	.51	
Cheltenham	15,731	227	14.4	*0.00	.....	....	
Mt. Lebanon	13,403	....	....	47.50	9,390	.70	
Stowe	13,368	99	7.4	36.75*	3,638	.27	[17]
Harrison	12,387	125	10.1	50.00	6,250	.50	
Radnor	12,263	116½	9.5	40.00	4,660	.40	
Rosa	8,581	62	7.2	41.36*	2,564	.30	[16]
Mifflin	8,167	91	11.1	50.00	4,550	.56	
Baldwin	6,371	105	16.5	47.50	4,987	.78	
Springfield (Mont'y)	5,541	75	13.5	40.00	3,000	.54	
Springfield (Del.)	4,589	45	9.8	40.00	1,800	.39	
Plymouth	4,369	32	7.3	40.00	1,000	.23	[18]
Upper Moreland	3,989	36	9.0	40.00	1,440	.36	
Tinicum	3,630	39	10.7	40.00	1,560	.43	
Lower Chichester	3,473	18	5.2	40.00	720	.21	
Leet	1,272	14	11.0	48.50	679	.53	

Removing Sewer Stoppages

Methods and Equipment Used in Hanover, Pennsylvania

By C. A. ECKBERT
Borough Manager

HANOVER BOROUGH has a modern sanitary sewer system with 18½ miles of 8-, 10-, 15- and 22-inch terra cotta pipe main-line sewers. Connected to the main line are 2,987 sewer services averaging 60 feet in length from the main sewer in the center of the highway to the inside wall of the house, making a total of 33 miles of sewer service laterals. The system handles 95 per cent domestic sewage and 5 per cent industrial sewage. No storm water is allowed to enter the system. All sewage is treated at a modern sewage-treatment plant consisting of screens, Imhoff tanks, sprinkling filters, chlorination and final settling tanks.

The Sewer-Cleaning Unit

In order to keep this system of main sewers and laterals in proper working order, it is necessary to maintain a sewer-cleaning unit consisting of two laborers with a 1-ton dump-truck equipped with 300 lineal feet of Wolverine ¾-inch galvanized steel rods in 50-foot lengths, single and double rotary heads with shank, different sizes of revolving spiral drain cleaners, one wiggly auger, a 4-inch diameter red rubber pump, 500 feet of Pollard 4-foot coupling rods equipped with wire brushes, scoop, screw, gouge, scrapers and root cutters, electric hand lamps, wrenches, picks, and shovels.

Attacking a Clogged Line

When a main-line sewer is clogged and the obstruction cannot be removed at once, a Barnes 150-gallon non-clogging sewer pump is placed at the nearest manhole above the obstruction, and a 2½-inch fire hose is stretched on top of the ground and run to the nearest open manhole beyond the obstruction. While work is carried on, this pump handles all of the sewage. The obstruction is removed either by dislodging it with rods or by digging up the line.

The average main-line stop-up is caused by tree roots. The common North Carolina poplar is the worst offender. With our modern equipment consisting of steel and wooden rods, the average obstruction is usually removed within one or two hours, and often in less time. The average daily sewer stop-up on our system is two a day on laterals, with an average of one a week on main-line sewers. Fire hose attached to a fire-plug is used in some cases to help open clogged sewers, for it has been found that this works out very well.

The two men comprising the sewer-cleaning unit are on regular duty ten hours a day. The Department operates 24 hours a day and in case of an emergency, the sewer-cleaning unit is called on any time during the 24 hours and on holidays and Sundays. The unit's other duties, when it is not working on sewer stoppages, consist of looking after the five sewage ejector stations and general pertinent duties in all parts of the sewer system. The men are paid 35 cents an hour.

A 4-inch clean-out opening is required on the inside of the cellar wall of each building, so that when a sewer lateral is clogged, the sewer men can run the 50-foot steel rods in and open the obstruction. We find that rags, heavy grease, and tops of milk bottles and other household wastes generally cause sewer lateral obstructions.

Costs

The sewer system is operated through money derived from sewer rentals, which amount to $24,616.80 per year. It costs approximately $5,000 to operate the sewage-treatment plant, $5,000 for administration, $5,000 for maintenance and such lateral construction as is paid for by the Borough. The remainder of the income goes for debt service.

Refuse Disposal by Separation and Incineration

J. C. Dawes, F. R. San I., Inspector of Public Cleansing, Ministry of Health, Describes a Common Method of Disposal Used in England

IT sometimes happens that suitable land is not locally available for controlled tipping, which is used extensively in England, replacing the old unsanitary dumps, except by introducing another and usually costly factor, that of secondary transport to carry the refuse a considerable distance. This led to the introduction of a mechanical process of treatment. In these circumstances the separation and incineration method is one of the first to receive technical consideration in the light of analyses of the local refuse, the site selected for the plant, and general local conditions.

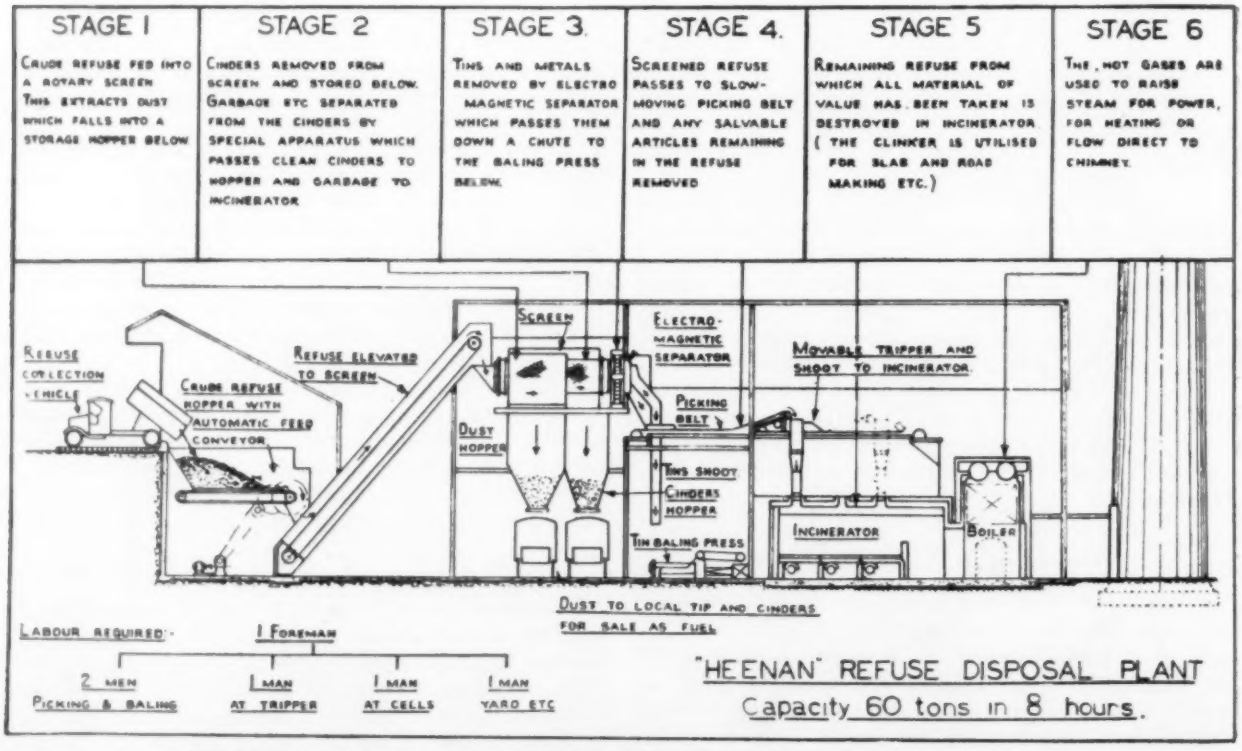
The separation and incineration process means, broadly, the preliminary separation of the fine dust by means of rotary screens of suitable mesh, and the subsequent incineration of the dustless surplus or "tailings," but the plants can be and are designed to make possible the further extraction of any materials useful to industry.

Composition of Refuse

The average composition of London refuse in 1927, used as an example, is given in the next column.

Material	Per Cent
Fine dust, less than 5/16-inch	28.14
Fuel, small cinder, etc., above 5/16-inch but smaller than ¾-inch	14.57
Fuel, large cinder, above ¾-inch, but smaller than 1½-inch	12.11
Putrescible matter	13.73
Paper	15.04
Metal, containers and other scrap	3.61
Rags, including baggings, etc.	1.78
Bottles and broken glass	3.00
Bone	0.97
Combustible débris, unclassified	4.29
Incombustible débris, unclassified	2.71
Not accounted for	0.05
	100.00

It will be noted from this table that the "dust" content, that is, the material smaller than 5/16-inch, may be as high as 28 per cent by weight in the winter, and in many places the figure is even higher than this. This dust is very troublesome. In the first place, it often carries a moisture content of 25 per cent or more, and from an incineration standpoint this is a disadvantage; secondly, while it sometimes has a colorific value of about 3,000 B.t.u. per pound, it is largely made up of inert matter. Its effect in a furnace is to keep down the temperature, and some of it adheres to the walls, particularly where


STAGE 1
CRUDE REFUSE FED INTO A ROTARY SCREEN THIS EXTRACTS DUST WHICH FALLS INTO A STORAGE HOPPER BELOW
STAGE 2
CINDERS REMOVED FROM SCREEN AND STORED BELOW. GARBAGE ETC SEPARATED FROM THE CINDERS BY SPECIAL APPARATUS WHICH PASSES CLEAN CINDERS TO HOPPER AND GARBAGE TO INCINERATOR
STAGE 3
TINS AND METALS REMOVED BY ELECTRO MAGNETIC SEPARATOR WHICH PASSES THEM DOWN A CHUTE TO THE BALING PRESS BELOW.
STAGE 4
SCREENED REFUSE PASSES TO SLOW-MOVING PICKING BELT AND ANY SALVABLE ARTICLES REMAINING IN THE REFUSE REMOVED
STAGE 5
REMAINING REFUSE FROM WHICH ALL MATERIAL OF VALUE HAS BEEN TAKEN IS DESTROYED IN INCINERATOR. (THE CLINKER IS UTILISED FOR SLAB AND ROAD MAKING ETC.)
STAGE 6
THE HOT GASES ARE USED TO RAISE STEAM FOR POWER, FOR HEATING OR FLOW DIRECT TO CHIMNEY.
REFUSE COLLECTION VEHICLE
CRUDE REFUSE HOPPER WITH AUTOMATIC FEED CONVEYOR
REFUSE ELEVATOR TO SCREEN
SCREEN
DUST HOPPER
ELECTRO-MAGNETIC SEPARATOR
PICKING BELT
TINS SHOOT
CINDERS HOPPER
TIN BALING PRESS
MOVABLE TRIPPER AND SHOOT TO INCINERATOR
INCINERATOR
BOILER
DUST TO LOCAL TIP AND CINDERS FOR SALE AS FUEL
LABOUR REQUIRED:-
1 FOREMAN
2 MEN PICKING & BALING
1 MAN AT TRIPPER
1 MAN AT CELLS
1 MAN YARD ETC
"HEENAN" REFUSE DISPOSAL PLANT
Capacity 60 tons in 8 hours.

THE SEVERAL PROCESSES USED IN A SEPARATION AND INCINERATION PLANT IN ENGLAND

these are of brick; and where water-tube boilers are connected, it often causes a heavy deposit of "moss" on the tubes. Lastly, and most important, some of it usually finds its way in a finely divided state into the chimney, to be finally broadcast and by no means always within the immediate surroundings of the plant.

Particular attention is called to the organic or "putrescible" content. The present tendency in England is for this content to increase and for the fuel content to decrease. For this reason it is necessary, when the putrescible content has to be incinerated, to use the highest possible temperature available in order to oxidize the gases as completely as possible and avoid one of the worst faults a disposal plant can have, namely, the emission of unsavory odors from the chimney.

Separation—The First Step

By the preliminary separation of the inert matter, the best use is made of the ordinary fuel content, the risk of dust distribution from the chimney is reduced, and the risk of burning odors is lessened. It follows also that the higher the temperature, the harder the clinker; and this, by the way, is produced by this method at the rate of 22 to 25 per cent of the tonnage incinerated instead of the usual 33 to 40 per cent by direct incineration. The disposal of this material is now a problem in many districts in England.

The extracted dust is separately disposed of in several ways. Sometimes it is sold for use on heavy land, where it has a useful physical effect; in many places it is used for grading recreation grounds, and in others it is merely dumped. There is, of course, some biological action following deposition on land in thick layers, and usually it is found desirable not to disturb the dust, except when required for agricultural or other special purposes, for several months, or until it is "dead," when it can be used to cover new refuse when required. Large quantities of this dust are used in the manufacture of a certain class of hard building brick known as London stock brick, and it is interesting to observe that the claim has been made that after prolonged exposure this dust will produce good grass without the addition of soil.

Sometimes not only dust but cinder, which is half-burned coal, is taken out mechanically and sold in a clean condition to manufacturers and others for direct steam-raising purposes; this, of course, happens only where steam is not required at the disposal plant. Arrangements also are made to permit the recovery of paper, metals, etc., from the dust-free refuse when the market prices are profitable and the demand good. The ferrous metals are recovered magnetically.

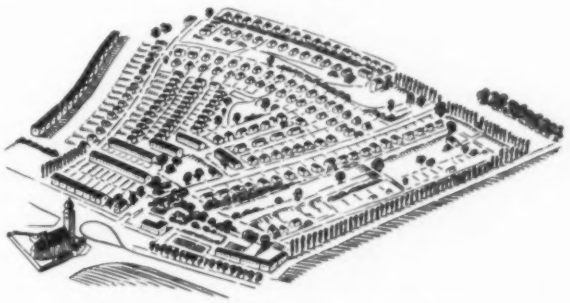
The mechanical plant required for this process is more extensive and complicated than that for direct incineration, because the whole of the operation, from the unloading of the refuse to the feeding of the furnaces, is mechanical; but the furnace requirement is practically halved, and a really good separation plant, intensively managed, is usually cheaper in operation than a direct incineration plant. The present costs, including everything, range from 78 cents to $1.32 per ton,* the average being about $1.02, and the quantities disposed of by this method in the larger urban districts in 1927-28 were 636,756 tons, whereas now the figure is about 1,250,000 tons annually.

The great importance of securing a clean, smokeless or comparatively dust-free chimney, particularly when the chimney is owned by the local sanitary authority, is obvious. It is the duty of such an authority to see that all plant chimneys within its area are as "clean" as possible, since atmospheric pollution is as great a problem as refuse disposal or many another public health problem, and operators of incinerators should therefore reduce this form of pollution to the practical minimum at their own works.

ACKNOWLEDGMENT.—From a paper presented before the Second International Congress of Public Cleansing, in Frankfort, Germany, August, 1935.

* NOTE.—The English ton is 2,240 pounds avoirdupois, or the equivalent of the United States long ton.

AN INTERESTING RECENT SUBDIVISION IN MUNICH



PLAN OF "MUSTERSIEDLUNG RAMERSDORF"

TYPICAL HOUSES IN RAMERSDORF

(Illustrations by courtesy of German Tourist Information Office, New York City)

Wisconsin's Well-Drilling Code

By FRANK R. KING
State Domestic Sanitary Engineer, Wisconsin State Board of Health

As far as is known, Wisconsin was the first among the states to enact a comprehensive law providing for the registration and regulation of well drilling to furnish domestic water supplies. The law became effective January 1, 1936, after some six years of unceasing effort. The law is Chapter 434, Laws of 1935, now known as Chapter 161 of the Wisconsin Statutes.

Unwise location and faulty construction of wells has cost Wisconsin dearly in the past, and the same is probably true in many other states. Under the new procedure, the chief aim of the state of Wisconsin will be to insure proper location, construction and finishing of wells, and proper installation of pumping equipment. Because Wisconsin's geological picture is so varied, many local problems enter into the proper location and construction of wells. For this reason the Legislature included in the law a provision that educational work be conducted in conjunction with the administration of the law.

The code of rules to be adopted by the Board will be supplemented with illustrated helpful information, so that the duties imposed by the Act can be more readily enforced. In the formulation of this code, a comprehensive study of existing conditions in Wisconsin is being made now, and conferences are being held with well drillers, manufacturers of well-drilling and water-supply equipment, and others interested, all of which is provided for in the law. Every effort will be made to make this code of minimum requirements readily comprehensible, and consistent with economy in installation, proper service and sanitation.

Requirements of the Law

The Wisconsin Legislature has given the State Board of Health discretionary powers as to methods, procedure to be followed in the location, construction and safeguarding of wells the water from which is to be used for human consumption. To this end, the Board is authorized to prescribe minimum, uniform standards and regulations for well drilling and pump equipment, state-wide in application. So that the general public may be given an opportunity to be heard, the Act provides for a public hearing, ten days' notice of which must be given in the official state paper before the regulations may be adopted by the State Board of Health and published so as to have the force and effect of law.

To carry out the purpose of the law, the State Board of Health may conduct experiments, make investigations, and inspect the water supply on private and public premises, require analyses of water, order the discontinuance of any supply found contaminated, and disseminate information in the interest of public health.

All drinking-water well drillers must file application and register annually before March 1 with the State Board of Health on blanks furnished by the Board, and must secure a permit before engaging in well drilling. This part of the law went into effect on January 1, 1936. A fee of $10 must be paid when filing an application. All permits expire on December 31 of each year and are renewable without filing a new registration application, but the holder must file a permit-renewal application before March 1. The registration and permit feature of the law does not apply to the construction of wells where the water is used for stock watering or other than for human consumption. Permits may be suspended or revoked by the Board for certain causes stated in the law, but in all cases the well driller is to get a copy of the complaint made against him, and is to have an opportunity on at least ten days' notice to answer the charges. No permit can be revoked without a public hearing. One year after revocation, application may be made for a new permit.

Any person who engages in the business of well drilling without securing a permit, or who otherwise violates any provision of the law or any rule or regulation prescribed by the State Board of Health, is subject to a fine of from $10 to $100 or imprisonment for at least 30 days, or both, and each day during which a violation continues constitutes a separate offense.

In the administration of the law, the State Well Drilling Supervisor will make an inspection of private and public water supplies, wells and systems as time will permit, and upon request or discretion of the Board as may seem necessary. In case of any dispute or difference arising between the Supervisor and the well driller in charge, the facts are to be submitted to the State Health Officer for consideration. If the State Health Officer deems a hearing necessary, it will be granted, as will be directed by him.

Discretionary Powers

In a law or act, and a sanitary code so far-reaching in scope, certain discretionary powers on the part of the Well Drilling Supervisor seem imperative for reasonable enforcement of the regulations governing the industry. Therefore, when for specific reason, it may be impractical to construct a well and install pumping equipment, whether new or existing installation, so as to strictly comply with the provisions of the code, reasonable compliance may be accepted as it pertains to design, materials, construction and appliances. The Supervisor employed by the State Board of Health will therefore be given discretionary power to permit such modifications as are not inconsistent with the spirit and substance of the law and regulations governing, providing that in doing so he will not unnecessarily endanger the safety of the drinking water. All such modifications must be reported in writing in such a manner as the Board prescribes, and must be filed as an official record.

—From a paper presented before the National Convention of the American Association of Water Well Drillers at St. Louis, Mo.

Absurd Land-Overcrowding Allowed by Many Zoning Ordinances

IN his capacity as Chairman of the American City Planning Institute's Committee on Research in Urban Land Policies, the Editor of THE AMERICAN CITY *submitted to that organization at its meeting in Richmond, Va., last month the following report:*

Believing that the zoning ordinances of most of our cities need early and drastic revision, your committee has been gathering information as to the degree of land-overcrowding now permitted in residential buildings in the congested sections of large cities. This survey has been made by means of a questionnaire addressed on April 14 to the American Planning and Civic Association's list of 66 planning commissions in cities of over 100,000 population.

The following questions were asked:

1. What is the maximum bulk in cubical contents (or square feet of floor area) which would be legal for a new multi-family building on a one-acre lot, if built to the greatest height and lot coverage permitted under your zoning ordinance?

2. If your ordinance has a density limit, what is the maximum number of persons (or families) which may be housed in a new building on a one-acre lot?

3. Has your zoning ordinance been amended recently, to reduce future land-overcrowding? If not, is such an amendment now under consideration?

Replies have been received (up to May 4) from 42 cities. Of these, 28 of the answers to Question 1 were sufficiently definite for tabulation:

Bulk Restrictions

City	Maximum Bulk	Maximum Floor Area
Atlanta, Ga.*	2,065,000 cu. ft.	247,800 sq. ft. (total)
Buffalo, N. Y.	4,247,100 " "	
Chicago, Ill.	5,227,200 " "	39,204 " " (per floor)
Cincinnati, Ohio	2,401,600 " "	
Cleveland, Ohio	4,250,000 " "	
Dayton, Ohio*	2,756,600 " "	34,514 " " (per floor)
Denver, Colo.	3,404,660 " "	
Duluth, Minn.*	2,900,000† " "	258,800* " " (total)
El Paso, Texas	4,650,000 " "	26,136 " " (per floor)
Erie, Pa.	1,400,000 " "	112,000 " " (total)
Fort Wayne, Ind.	1,306,800 " "	
Hartford, Conn.*	2,250,000 " "	30,000 " " (per floor)
Kansas City, Mo.*	2,634,220 " "	293,580 " " (total)
Louisville, Ky.*	4,356,000 " "	
Los Angeles, Calif.	3,920,400 " "	
Memphis, Tenn.*	4,774,800 " "	
Milwaukee, Wis.	5,445,000 " "	
Minneapolis, Minn.	4,237,000 " "	
Nashville, Tenn.	6,519,000 " "	
New Bedford, Mass.	1,557,720 " "	25,962 " " (per floor)
New Orleans, La.*	2,209,950 " "	176,797 " " (total)
New York, N. Y.	4,400,000 " "	
Providence, R. I.	4,664,000 " "	
San Diego, Calif.		26,136 " " (total)
Scranton, Pa.	1,437,480 " "	23,958 " " (per floor)
Spokane, Wash.		277,450† " " (total)
Washington, D. C.	4,261,000 " "	390,680 " " (total)
Yonkers, N. Y.	2,273,400 " "	

NOTES to the foregoing table:

* See also density restrictions in the table in the next column.

† From the Duluth figures the areas of "necessary interior courts" should be deducted. For Spokane the total floor area indicated is "absolute maximum permitted by the zoning ordinance under the city's 8-story height limit, and this total would actually be greatly reduced by required light courts and the necessity of providing windows for all rooms."

As will be seen, half of the replies listed above gave no answer to the question as to maximum permissible *floor* area. Where such figures were given, as above indicated, some replies showed the maximum floor area for the entire building, and others the maximum area per floor.

It will be observed from the foregoing tabulation that the city of New York, though high in the hierarchy of sinners, is not the only or indeed the worst offender as to permissible land-overcrowding with residential buildings. In several cities, including New York, it is legally possible in this year of enlightenment, 1936, for a developer to erect on a one-acre plot a residential building having a bulk of more than 4,000,000 cubic feet. Let us see what this means.

Assuming no serious overcrowding *within* the building —allowing, say, 10 vertical feet per floor, and 240 square feet (of the gross floor area) per room—this would mean an occupancy of one person for each 2,400 cubic feet of the bulk of the building. Hence a multi-family building with a bulk of 4,000,000 cubic feet on a one-acre lot, would house, on a plot less than 210 feet square, more than 1,600 persons. In other words, 100,000 persons could thus be housed on about 60 acres—less than one-tenth of a square mile—an obviously needless and absurd degree of congestion.

In few cities are there bulk or density restrictions as such. In general, therefore, the figures in the foregoing list are not to be found in the respective zoning ordinances, but represent computations of zoning or planning officials as to maximum bulk for which a permit would be granted under existing restrictions as to height, lot coverage, and requirements as to courts, yards, setbacks, etc.

Density Restrictions

Families-per-acre restrictions were reported by the following cities, the figures given in each case being presumably those for the apartment house district of highest density. The figures are based in most cases on restrictions as to minimum lot area required per family. The Louisville minimum, for example, is 250 square feet of lot area per family; New Orleans, 400 square feet; and Memphis, 625 square feet.

City	Maximum Families per Net Acre
Atlanta, Ga.	70
Dayton, Ohio	174
Duluth, Minn.	216
Hartford, Conn.	140
Kansas City, Mo.	116
Louisville, Ky.	174
Memphis, Tenn.	69
New Orleans, La.	108.9
Wichita, Kans.	174

Replies from Boston and Indianapolis give details as to height limits, open space requirements, etc., too lengthy to quote here, but without the figures as to possible maximum cubage or floor area specifically requested in the questionnaire. Worcester, Mass., and Portland, Ore., report that those cities are zoned for use only. Detroit, Mich., and Reading, Pa., report that their cities are still unzoned.

Special Provisions of Various Ordinances

From several cities interesting information was received in addition to that from which the foregoing tables were compiled. For example:

NASHVILLE, TENN.—While the palm for possible excessive cubage goes to Nashville, which would allow a residential building of over 6,500,000 cubic feet on the widest street in its downtown area, it also wins the palm for the greatest spaciousness in its multi-family districts. Gerald Gimre, City Planning Engineer of Nashville, writes: "While the zoning law would permit a residential building of large cubage in the least restricted *commercial* zone, the ordinance requires in the least restricted *residential* zone 1,800 square feet of lot area for each family." (This means only 24 families per acre).

LOUISVILLE, KY.—H. W. Alexander, Secretary of the City Planning and Zoning Commission, explains that in the least restricted multi-family district of that city the zoning ordinance provides that there shall be a lot area of not less than 250 square feet per family. This regulation, however, does not apply to hotels or apartment hotels, and it is the maximum cubage for the latter which is given in the foregoing table. For the ordinary type of apartment house the provision of 250 square feet of lot area per family would restrict the density to 174 families on a one-acre lot; and this would of course involve a much smaller bulk of building than that permitted for apartment hotels.

BUFFALO, N. Y.—The cubage figure for Buffalo as given in the table is for a special apartment house classification, the definition of which is "a building having apartments with cooking facilities and also a central dining room." Such a building on a 100-foot street could rise to a height of 150 feet, or 1½ times the width of the street; and it could occupy 55 per cent of an interior lot or 65 per cent of a corner lot. For the ordinary type of apartment houses E. G. Speyer, Consulting Engineer of the Buffalo Planning Board, points out, the restrictions are more drastic. The height is limited to one-half the width of the street upon which it faces, except that for each one foot that the building sets back from the street line, one foot may be added to the initial height limit. For such buildings the lot coverage is limited to 40 per cent on an interior lot, or 50 per cent of the area of a corner lot.

FORT WAYNE, IND.—As reported by Robert B. Hanna, Consultant, the Fort Wayne ordinance contains the following provision for apartment house districts: "The aggregate volume in cubic feet of all buildings on a lot, exclusive of the ground story of a private garage or community garage and the ground story of other auxiliary buildings, shall not exceed the area of the lot in square feet multiplied by 24, or by 30 in the case of a corner lot."

SPOKANE, WASH.—B. H. Kizer, President of the City Plan Commission, writes: "Permit us to suggest that the density limit or land-overcrowding provision is not a necessity for Spokane, due to the fact that our little city is one of the most widely dispersed in America. It occupies 66 square miles with a population of 120,000, is a commercial city with no industrial section, and even its poorest sections do not suffer from overcrowding."

Recent or Proposed Revisions of Zoning Ordinances

Little recent progress appears to have been made in the revision of zoning ordinances. Some comments on this phase of the problem follow:

PROVIDENCE, R. I.—A letter from John H. Cady, Chairman of the City Plan Commission, says: "The zoning ordinance has not been recently amended. A factual survey of the city recently completed by the City Plan Commission has disclosed a great inflation of business and industrial districts, and it has been calculated that 200 years of normal United States growth will be required to fill the zoning envelope of those districts. On the other hand, fully restricted single-family residence districts in the city are nearly filled. A re-zoning of the city has been recommended by this Commission."

YONKERS, N. Y.—T. T. McCrosky, Planning Director, states that the question of amending the zoning ordinance is under consideration by the Planning Board, and he adds: "We believe that the permitted building bulk is excessive, but it may prove difficult to secure a more restrictive clause in the ordinance."

BUFFALO, N. Y.—Mr. Speyer writes: "Buffalo's zoning ordinance has not been amended recently, but the Buffalo Planning Board is now studying the same and will probably recommend changes."

SAN DIEGO, CALIF.—Glenn A. Rich, City Planning Engineer, sends a new coverage ordinance adopted July, 1935. Under this a multi-family building on an interior lot may not occupy more than 50 per cent of the area of an interior lot, or 60 per cent of a corner lot, and a smaller coverage is required on upper floors.

LOS ANGELES, CALIF.—Finally, a quotation from a letter from Huber Earl Smutz, Zoning Engineer of Los Angeles—placed last because it is the longest, but by no means the least interesting reply received:

"We have a single-family residence zone and a four-family residence zone, but the other two multiple residential zones only control the height and the lot coverage of a building, rather than the family capacities in the building. Of course, our charter height limitation of 150 feet applies in all zones. Approximately a year ago we adopted a comprehensive Yard Ordinance, which, combined with the Zoning Ordinance, provides comprehensive zoning for the city. . . .

"Another provision of our Zoning Ordinance, which was added approximately a year ago, we believe is rather unique. This requires that on every "R" zone lot to be occupied by a multiple residential use, there must be provided on said lot, garage space for one automobile for each family unit provided on the lot. Due to our high per capita ownership of automobiles, we have found this regulation to be absolutely necessary to relieve the unbearable automobile parking situation on apartment house streets where they have been using the street space for garage purposes. To a certain extent this provision also prevents the erection of extremely large apartment buildings unless they are adequately financed and can justify the construction of garage space on the ground floor or basement thereof.

"The FHA property standards have awakened people in Los Angeles to the benefits of proper zoning protection, and as a result we have had numerous requests to re-zone areas formerly zoned for apartment houses back to the single-family or four-family residence zones to afford greater protection. All of these re-zonings materially assist in controlling the density of population in the areas affected."

See also "The Zoning Round-Table at the Planning Conference at Richmond," page 121 of this issue of THE AMERICAN CITY

Sewage Treatment at Sioux Falls

Part I—Historical

Sudden Increase in Packing-House Wastes Overload Otherwise Adequate Plant

By JOSEPH B. ESTABROOK
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THE sewage works at Sioux Falls, as finally completed, is a unique arrangement, and is especially interesting because of the refinement of treatment possible, and also because of its flexibility. It was designed especially with the view of handling packing-house wastes in large quantities when mixed in approximately equal volume with ordinary domestic sewage. It is perhaps the most complete disposal system at present operating anywhere in the world, and has the unique feature of combining in the secondary treatment portion of the plant two orthodox methods of aeration, trickling filters and activated sludge in series.

The 1926 Plant

In 1926 the city had decided on treating its wastes and had built a treatment plant which consisted of (1) a hand-raked bar-screen with an improvised incinerator fired with digester gas, (2) an orthodox type of grit chamber consisting of channels with adjustable outlet weirs to control velocities, (3) two 70-foot Dorr clarifiers, (4) three 80-foot separate sludge digesters complete with stirring mechanisms which were of entirely adequate capacity for this purpose, and (5) 4.2 acres of trickling filters which consisted of a 9-foot bed of well-graded Sioux quartzite, complete with the distribution and drainage piping system suitable for this purpose. The distribution system consisted of lines of piping equipped with Taylor nozzles on approximately 20-foot centers. These gave as adequate a distribution of liquid over the beds as is possible with this type of equipment. But, owing to lack of funds, secondary sedimentation was omitted. The system functioned very well in this fashion. Had the character of the sewage to be treated remained that of a rather strong domestic waste with an oxygen demand of 300 to 350 parts per million before initial sedimentation, this system would probably have been satisfactory for many years.

Local Packing Plant Grows

The city had at the time an investment of perhaps three-fourths of a million dollars in a disposal plant which was of the conventional type and well designed for a city of approximately 40,000 people. It also had what should be ample additional capacity for normal growth and was probably in every way suitable for its purpose, had it not been for the extraordinary growth of a local packing plant which had more than quadrupled its kill during the period from 1926 to 1932. This increase in the volume and strength of the discharge from the packing house brought the population equivalent, which was used for calculating the capacities of the various treatment units in the disposal works, from 40,000 to 128,000. This also put an overload on the filter beds of from 200 to 300 per cent. The usual designed capacity of beds of this type is two million gallons per acre of bed, assuming that the liquid to be aerated has, after primary sedimentation, a bio-chemical oxygen demand of from 120 to 250 parts per million. In this case, however, the B.O.D. of the combined domestic and packing house sewage averaged over several months in excess of 500 ppm. In spite of this, the filter beds were effecting a reduction of over 70 per cent. This enormous overload tended to clog the beds seriously and made the operation of the plant precarious and difficult.

After several years of unprecedented drouth in that portion of the Middle West, the problem of disposing not only of the city's normal domestic and industrial wastes, but also of the discharges from a large slaughtering and packing house, the John Morrel Co., had to be solved. All of this material was discharging into the Big Sioux River, which had practically dwindled to nothing and developed a situation so serious that the city authorities were in the position of trying to find some way in which the city could continue to exist and operate, and yet not render entirely unfit for use the entire farming district downstream.

Low Stream Flow

The extent of the pollution may perhaps be appreciated from the fact that the U. S. Geological Survey established a gaging station in the Big Sioux River above the main outfall of the disposal plant. A study of the gaging records in the river revealed that for the months of July and August, in 1932, there had seldom been more than one second-foot of flow in the river, whereas the disposal plant had been discharging partially treated sewage at the rate of 3,500 gallons per minute or 7.8 second-feet, having a B.O.D. of approximately 150 and approximately 100 ppm of suspended solids.

The problem, therefore, was to obtain so complete a treatment that all the city's wastes which would have to flow through a very small river with low and sandy banks through an excellent farm and dairy country, could be made sufficiently clear and stable so that the cattle could continue to utilize the water without very serious danger, not only of a cattle epidemic—which is an ever-present danger—but also of pollution of milk. A number of lawsuits aggregating very large sums of money had been started against the city by riparian owners downstream, and inasmuch as a major part of the land involved is in the adjacent states of Nebraska and Iowa, the action had been taken into Federal Court and injunctions were being requested to restrain the city from discharging its wastes into the river. This, of course, created an impossible situation,

since the Big Sioux River is the only possible drainage for several tiers of counties in eastern South Dakota.

State Records Valuable

When the investigation was started in 1932, the State Board of Health of South Dakota had just completed a chemical analysis of the operating results of the plant, in which records over the entire summer of 1932 had been taken and compiled. These data made the task of recommending the proper and necessary improvements for the plant very much easier. It was found that the plant at that time had been effecting a reduction of 83.7 per cent in the actual strength of the sewage which it took in, and a reduction of 72.8 per cent in the content of suspended solids. The remaining suspended solids discharged into the Big Sioux River were being carried down the stream. In normal circumstances, this would have been somewhat better than the average operating efficiency of this type of plant, and no criticism is possible of the operation of the disposal works.

The average oxygen demand recorded in parts per million of the raw incoming sewage was approximatly 800 parts per million for the mixed liquor (that is to say the combined packing-house and domestic wastes) and approximately 1,100 for the packing-house sewage only. This is indeed very high for the discharge of most cities averages from 230 to 300, and in the case of Chicago and other cities where the water is not metered and for that reason is used very freely, the sewage strength is around 120 to 160 parts per million. The problem, therefore, was to take a well-operating plant of this type and raise the total reduction from a percentage in the low 80's to one in the high 90's.

Experimental Plant Needed

The matter of funds available was also a serious drawback and limited the amount and type of construction which could be done, since the city was well up toward the limit of indebtedness which it could assume under the South Dakota law. This limited drastically its ability to borrow funds for this purpose. After some months of study, a report was prepared and delivered to the city. This report was reluctant to recommend changes in the plant, for none of the usual improvements appeared to be exactly the right answer to the problem involved. It was suggested, however, that the city make an appropriation for experimental work and that at the same time a stipulation be reached with the plaintiffs in these pollution suits, who were pressing for the hearing of their cases in court against the city, to postpone these trials for a time sufficient to enable the City Commission to spend the following summer and fall in determining what means should be taken to remedy the trouble; and that an additional year be given for construction. This seemed to every one concerned to be the best means of attacking the problem, and this method was adopted.

(To be continued in the July issue with a complete description of the experimental plant and its operation)

Why Build Structures Where Flood Waters Can Reach Them?

WHY are hamlets, villages, cities, manufactories of all kinds, water works, steam power plants and railways placed so low along streams and on islands in rivers or in gorges as to be subject to damage by flood? Why should there have been more than 170 fatalities this spring, tens of thousands of people rendered homeless, and a destructive loss of up to $500,000,000, as is roughly estimated, in a dozen states lying between the Ohio Valley and Maine?

In some towns that have had damaging floods there are high-water marks to which citizens point with what might be termed regrettable pride, and say that the height has not been reached since 1889, or 1907 or 1918 or 1928—that is, up to 1936. What else can be expected when people build so low on a stream bank? But not having been seriously molested by water over a long period they may say, "We are here and shall have to remain and pay flood losses, because to move would be too costly and almost impossible." But would it?

Engineering News-Record argues correctly that not every case of high water can rightfully be called a "flood disaster," and at least some of the losses being reported are the result of human heedlessness. Men who build houses on low-lying river banks must expect to have spring freshets rise above their doorsteps. The distinction between "high water" and "flood" must be kept carefully in mind if sound flood-control planning is to go forward. It will never be possible, even were it worth while, to control every river and brook to the point of complete equalization of flow. In one industrial region during the recent flood, the Federal authorities were rather severely criticized for not having built regulating dams on the tributaries to the main streams, the latter already having dams. But it is doubtful whether such devices would have held back or regulated such enormous volumes of water as recently flowed down our rivers.

Many works are built along streams because some are navigable and it is inexpensive to transport raw materials thereto, and finished or semi-finished products therefrom. But many plants are on rivers which are not now navigable and which never will be so. Such streams are handy for water supply and for the discharge of inoffensive plant waters, although little of this can be done where stream-pollution regulations are enforced. Steam power plants are placed on streams, when navigable, for cheap delivery of coal by barge, and because of an abundance of water for condensing exhaust steam from the turbines. Blast-furnaces, open-hearth furnaces, rolling mills and by-product coking plants require enormous volumes of water. However, as this water has to be lifted from the river, a few feet additional above the danger line of floods should be worth consideration. Pumping plants for city water supply are often built as near streams as possible, and during floods they may be "drowned" at the same time that a power-plant along the same river which is supplying energy to the pumps is flooded. Then the community has no water supply.

Various expedients are now proposed to try to prevent, at huge expense, waters from damaging communities, lands, and factories. While the recent floods were subsiding, Congressmen met in Washington to plan a flood survey and future control of high waters. It is proposed to deepen, widen, and straighten rivers, also to build dams on feeder streams. Such engineering projects will help more or less. Wide and high levees should be built, as along California rivers. Concrete walls, as at Columbus and Portsmouth, Ohio, are useful, but they must be high and well designed. The building of new or extended communities and works at higher levels should be a part of all city and industrial planning. And another public advantage of locating home and industries back from the river banks wherever possible, would be the resulting availability of such waterfronts for recreation or parkway purposes.

M. W. von BERNEWITZ,
Engineer-Journalist, Pittsburgh, Pa.

Spraying Elm Trees to Eradicate the Elm Bark Louse

By C. R. CLEVELAND
Entomologist, Standard Oil Company of Indiana

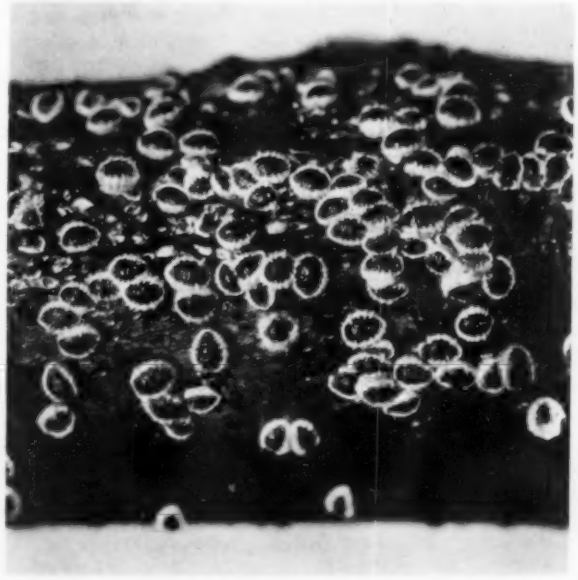
SO many complaints have been registered by pedestrians and automobile owners regarding a reddish-brown gummy substance dropping off elm trees, that a number of Mid-Western cities are studying the plan by which Detroit, Mich., is wiping out the European elm scale, or elm bark louse. With employment provided by WPA, and spray oil and power machinery supplied by the city, Detroit is eradicating this insect which damages clothing and auto finishes, litters pavements and sidewalks, and disfigures and sometimes kills trees.

Spraying of trees on boulevards and estates, and in parks and cemeteries, was carried on in Detroit for several years until interrupted in 1930, and it was resumed two or three years later when the city was aroused by complaints. In the fall of 1934 the Department of Parks and Boulevards began its first intensive campaign against the bark louse, and up to March, 1936, has sprayed more than 200,000 trees. This spring 80,000 more will be sprayed, which will about cover all the elms within the city limits.

C. Edmond Smith, Superintendent of Forestry and Landscape of Detroit, states that in the spring of 1935 he used an average per tree of 0.6-gallon of spray oil, and 8 gallons of spray solution. In the fall of that year, he used 1.003 gallons of spray oil (Dentrol), and 15.1 gallons of spray solution. "The difference," he explains, "is due to a greater number of smaller trees that were sprayed in the nursery. The fall spraying was for large American elms 40 to 90 feet high."

Photograph by courtesy of The Hardie Manufacturing Co., Hudson, Mich.

FIGHTING TREE PESTS



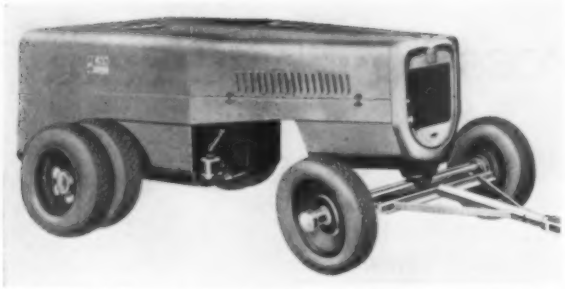
Photograph by courtesy of Colorado Agricultural Experiment Station, Fort Collins

EUROPEAN ELM SCALE
Mature females clustered on underside of limb, enlarged

Disease Widespread

In the East a sustained effort is being made to get rid of elm scale; but although the scale has been destroying shade elms generally throughout the Mid-West, it was not until 1935, and particularly during the winter just past, that cities in that section began to consider the ultimate danger and to plan eradication as a local WPA project. The insect exists in Milwaukee, Indianapolis, St. Louis, Topeka, Denver and Chicago, and it has been found in unusual numbers in the Fox River Valley, where the city of Geneva, Ill., is using spray oil. In almost every part of the country where the elm tree grows, this pest is active. It is particularly destructive to the Camperdown and red elms—less so to the American elm.

European elm scale is so distinctive in appearance that, once recognized, it will be readily remembered. In its most conspicuous stage, that of the adult female, it is reddish-brown, oval, about one-tenth of an inch long, and surrounded with a whitish fringe or margin. It is found fastened in crevices of the bark of trunk and limbs and on the underside of smaller branches in late spring and early summer. Active larvae hatch in late June, and first



Photograph by courtesy of John Bean Manufacturing Co., Lansing, Mich.

NEW TRAILER SPRAYER PUT IN SERVICE THIS YEAR NEAR DETROIT BY WAYNE COUNTY ROAD COMMISSION

settle on leaves, later migrating to trunk and limbs, where they hibernate in a partly grown condition. By sucking the sap from the growing tissues, the insect weakens a tree's vitality.

In America it is necessary to use sprayers to check the scale, because its natural enemies, which keep it under control in Europe, are absent. The one best treatment for scale insects is a clean, highly refined mineral oil, treated to emulsify completely in all proportions. It is mixed with water in concentrations ranging from 4 to 7 per cent, depending on the scale insect to be controlled, and sprayed on the infected trees. Properly and thoroughly applied, the spray oil registers a 100 per cent kill of adults, young and eggs, on elms and other species of trees. Spraying is safe, dependable, and cheap insurance.

Municipal Bathing Pool Liability

ALTHOUGH there are a few decisions to the contrary, most of the appellate courts of the country hold that municipalities operating bathing pools or beaches are not liable for injuries or deaths occurring at such places, although due to negligence of the municipality. This majority rule rests on the theory that the operation of municipal pools and beaches is a governmental function, within the general principle that cities, etc., are not liable for negligent performance of such functions. It is also generally held by the courts that the rule of non-liability is not defeated through the making of moderate charges for the use of municipal bathing and swimming facilities.

Typical of the prevailing judicial view is this expression found in the opinion of the Iowa Supreme Court in the case of *Mocha v. City of Cedar Rapids*, 214 N. W. 587, where defendant was exonerated from liability for death of a youth who drowned in a hole at a city bathing beach:

"A bathing beach is a general public benefit. * * * It affords the public, especially the young, the means of healthy recreation and athletic exercise. It is not of the nature of a corporate or business undertaking for the corporate benefit."

A similar conclusion was reached by the Nebraska Supreme Court in the case of *Caughlan v. City of Omaha*, 174 N. W. 220, where a bather was killed through diving into shallow water. In that case, the Court said that the fact that the city derived some revenue as an incident to operating the beach did not render it liable.

At first blush, the decision reached by the Utah Supreme Court in *Burton v. Salt Lake City*, 253 Pac. 443, is at variance with the general rule above stated. But a closer study of the decision harmonizes it with what other courts have ruled, on the score that the facts presented to the Utah court compelled an assumption that the city was operating the beach as a highly profitable business venture.

Among other courts that have recognized that municipalities are immune from liability in the operation of pools and beaches with a primary view to promoting the public health are the Massachusetts Supreme Judicial Court and the Supreme Courts of Kansas, Michigan, Minnesota and Wisconsin.

The comparatively recent opinion rendered by the Nebraska Supreme Court in the case of *Toft v. City of Lincoln*, 250 N. W. 748, will be found to contain numerous citations to cases where the question of municipal liability has been debated, including references to decisions of the appellate courts of Connecticut, Mississippi and South Dakota, where liability has been declared to exist.

Thus far we have considered the subject on an assumption that in a particular case a city's fault in contributing to an accident has consisted in negligence amounting to less than the maintenance of a *nuisance*.

The weight of judicial authority seems to be to the effect that immunity from liability for accidents occurring in the exercise of a municipal corporation's governmental functions does not extend to injuries caused by nuisances, although judges may differ on the point as to just what constitutes a nuisance.

In the case of *Hoffman v. City of Bristol*, 155 Atl. 499, the Connecticut Supreme Court of Errors decided that maintenance of a diving board four feet above the surface of water only a little more than three feet deep constituted a nuisance and rendered the city liable to a bather who was injured when his head struck the shallow bottom.

In the Lincoln case above cited, the Nebraska Supreme Court strongly intimated that where a dangerous condition existing at a municipal pool or beach amounts to a nuisance, liability may be enforced for injuries resulting as a direct and natural consequence. But it was held that the condition shown in that case did not amount to a nuisance.

What has been said concerning violent injuries would seem to be equally applicable to disease contracted by a bather while in water under control of a municipality. Consistency demands that the view that, if the condition of water is actually or constructively known to be such as to constitute a positive health menace to those bathing or swimming in it, the place is a nuisance and there is no immunity from liability, but that mere negligence in failing to exclude infected persons from a pool or beach would not render a city liable for resulting communication of disease to another bather.

Finding no case where the question of liability for communication of disease in the operation of a municipal pool has been raised or decided, one must resort to the following statement of a general rule of law as a basis for saying that liability exists where the pool amounts to a nuisance:

"Where a municipal corporation creates or permits a nuisance by nonfeasance or misfeasance, it is guilty of tort, and like a private corporation or individual, and to the same extent, is liable for damages in a civil action to any person suffering special injury therefrom, irrespective of the question of negligence; and such liability cannot be avoided on the ground that the municipality was exercising governmental powers." 43 Corpus Juris, 956.

A. L. H. STREET.

The Water-Softening Plant of Hamilton, Ohio

New Deep-Well Supply Chemically Softened and Filtered

AFTER a history of progressive improvements but dissatisfaction with its water supply, the city of Hamilton, Ohio, in 1933, secured funds from the Federal Public Works Administration for a complete new deep-well water supply, including the wells, spiral welded force mains, a new distribution reservoir and a water-softening and filtration plant. A site had been bought for the well field and filtration plant north of the city, consisting of about 95 acres, and also a site for the new distribution reservoir.

Treatment of the deep-well water supply consists of softening with lime, filtration, with recarbonation of the treated water, and chlorination.

Chemical Building

The new chemical building is a steel frame structure located north of the filtration plant. The exterior walls are of buff brick with terra cotta trim in a modified Gothic style of architecture. The basement of this building is a monolithic reinforced concrete unit containing 390 cubic yards poured continuously. The basement provides access to the piping and houses the sludge pumps and sump pump.

The entrance to the chemical building is on the south side, giving immediate access to the chemical room, the walls of which are of enameled brick with a painted ceiling and a cement floor. Many windows provide plenty of light and ventilation. This room contains the aerator, the Dorr chemical flash mix, chemical feeders and automatic scales. Adjacent to the chemical room on the west are two mixing tanks, each 13 feet wide by 45 feet long and 15 feet deep. Cypress baffle-boards and motor-operated Dorr flocculators are installed in each tank. Directly above the chemical room are the chemical storage bins. The capacity of each of these four bins is sufficient to permit the unloading of two carloads of chemicals, which are handled by a Draco pneumatic conveyor located on the top of the building in the penthouse. This conveyor is connected to the hose house at the railroad siding by means of a chemical suction line.

Immediately east of the chemical building are two reinforced concrete Dorr clarifiers 60 feet in diameter. In the center of each clarifier is a turntable which pivots two 30-foot arms which scrape the sludge that settles to the bottom of the tank, moving it to the center, where it is taken out through an 8-inch sludge line.

Connected to and on the south of the chemical building are the two carbonation tanks. Each tank is built of reinforced concrete and is 30 feet long and 10 feet wide, and has a water depth of 15 feet. In these tanks, the water from the clarifiers is carbonated by the addition of carbon dioxide gas transmitted from the boiler room of the main building through Transite pipe.

The Main Building

The main building is located 60 feet south of the chemical building and 500 feet east of the B. & O. Railroad. The west façade of the building is 125 feet long, the exterior treatment being Gothic architecture with the water tower rising near the center. The exterior walls are of buff brick trimmed with terra cotta relieved by a cap band in colored terra cotta. The windows are arched and have metal sashes throughout. Limestone steps lead to the arched entrance in the base of the tower, with double doors trimmed in polished aluminum. The entrance way leads to the lobby, which has walls of antique plaster finish. The floor is of colored tile with the seal of Hamilton worked into the design in the center of the lobby.

To the left is a corridor leading to the north wing of the building. Directly off this corridor is a stairway leading to the basement. Over this stairway, with a door from the lobby, is the women's rest room. The north wing contains the laboratory, office, and men's rest room. The laboratory is 30 feet long by 14 feet wide, and has a linoleum floor and an enameled brick wainscot with smooth plaster walls and ceiling. The office, which is 15 feet long by 10 feet wide, has the same finish as the laboratory. The men's room has a cement floor, enameled brick wainscot, and smooth plastered walls and ceiling.

The Pump Room

To the right of the lobby there is a door leading to the balcony of the pump room, which is 60 feet long by 30

GLIMPSES OF THE NEW WATER WORKS OF HAMILTON, OHIO

1. The clarifiers. 2. The main building, chemical house at left and filtration plant at right. 3. Operating tables in the filter gallery

feet wide, with a height of 28 feet from the floor to the ceiling. The walls are of white-enameled brick, with a 4-foot wainscot of brown glazed brick. The floor is of dull-red quarry tile. The ceiling shows exposed steel beams which support the roof slabs, insulation and built-up roofing. Overhead is a 10-ton crane which permits the easy handling of the heavy equipment.

From the balcony there is a stairway leading down to the pump-room floor. Upon this floor are the high-service pumps which were moved from the old pumping station. They consist of one 3-mgd. 225-hp Allis-Chalmers centrifugal pump and two 7-mgd 600-hp centrifugal pumps. Space has been provided for the installation of a future high-service pump. Also, in this room is a 750-gpm wash-water pump.

On the north wall of the pump room is the main control panel, which is 15 feet long and 7½ feet high, furnished by Westinghouse. On this are mounted the voltmeters, ammeters, watt-hour meters, circuit breakers, test switches, gages, etc., necessary in the operation of the plant. The height of the water level in the east reservoir, the west reservoir, and the clear well of the wash-water tank may be read from this panel. Meters record the amount of raw water, filtered water, or wash water used. A red light gives warning when the clear well is empty, and a bell rings when it is full. Also, a red light and bell give warning when the wash-water tank is full. Meters for high-service power, low-service power, and the current used for lighting, together with a meter showing the total station power used, are located upon the board. Circuit breakers for the high- and low-service pumps, the deep-well pumps and lighting, together with the other necessary equipment, make the panel board the center of control for the complete water system.

The North Wing

North of the pump room immediately beneath the lobby is the switch-gear room which contains the motor starters and switch-gear unit. The transformer room is under the entrance steps and houses three 333-kva transformers, one 50-kva and one 10-kva transformer. Beneath the steps which lead down into the switch-gear room, space has been provided for a battery room. In this room are storage batteries and a charging unit to be used for furnishing emergency lighting current.

The basement under the north wing of the building contains the ash room, coal room, coke room, boiler room and chlorine room. The boiler room contains the heating boiler, a CO_2 gas compressor and scrubber, a hot-water tank and a boiler for CO_2 gas. The chlorine room has the Wallace & Tiernan chlorinator and ammoniator which were formerly used in the old pumping station. Scales are also provided in this room for weighing the chlorine and ammonia and also the quantity of fuel used by the plant.

The Filters

On the first floor north of the lobby is the filter room. The corridor has a floor of tile with a wainscot also of buff-colored tile trimmed in green, with antique plaster walls and ceiling. On either side of the corridor are placed three filter-operating tables. Each filter is 25 feet long by 16 feet wide and contains a false bottom. The false bottoms are made of concrete and consist of a series of depressions of inverted pyramidal forms cast into the concrete, each connected with the pressure chamber below by a brass thimble extending downward through the concrete below the apex. Four 3-inch spheres of porcelain and two spheres of glazed earthenware having diameters of 1⅜ and 1¼ inches respectively fill these depressions. Next on the filter bottoms is 12 inches of graded filter gravel, which supports 27 inches of filtered sand, the lower 3 inches being coarser than the upper portion. The operation of each filter is controlled by Simplex rate-of-flow controllers. A Chapman automatic cone valve is used to control water levels in the various tanks and basins.

Above the lobby in the water tower of the main building is the steel wash-water tank, 22 feet in diameter and 25 feet high, having a capacity of 72,000 gallons. This water is used to backwash and rinse the filters.

South of the filters and east of the pump room is the clear well, which has a capacity of 500,000 gallons. It is from this well that the high-service pumps deliver the water through a master meter into the Armco spiral welded force main.

The W. S. Rae Co., of Pittsburgh, laid all the cast iron pipe to the deep wells and from the master meter vault to the beginning of the 24-inch mains. It also built the 36-inch sewer of concrete pipe from the main building about 1,600 feet north to the river. An 8-inch cast iron sanitary sewer line was laid paralleling the concrete sewer. At the river where these two sewers empty, a head wall was built and flap-valves were placed on the mouths of the two sewer lines to prevent the river at high-water levels from entering the pipe.

Electric current is provided the plant for power and lighting from the municipal electric light plant.

The F. K. Vaughn Building Co., Hamilton, Ohio, was awarded the contract for building the softening plant. This contract included the construction of the chemical building, the main building which includes the filter building, and the two clarifiers. The Roberts Filter Manufacturing Co., Darby, Pa., furnished and erected the equipment. The steel wash-water tank was fabricated and erected by the Chicago Bridge & Iron Work. Barstow & Le Feber, Inc., consulting engineers, of Akron, Ohio, designed the new plant and supervised construction.

Municipal Administration Progress

FOLLOWING are a few statements of progress, gleaned from The 1936 Municipal Year Book, annual municipal administration progress report of the International City Managers' Association.

Phenomenal reductions in fire losses were recorded in 1935. Contributing reasons are: the enactment of state laws providing for inter-city and inter-county contracts for fire protection; extension of training-programs for firemen to the point where more than 30,000 firemen attended schools in almost all the 48 states.

Indexes of municipal employment rose in the larger cities and dropped in the smaller ones. Forty-three cities made 82 non-resident appointments during the year, signalizing progress in the professionalization of the municipal service.

Establishment by the Federal Bureau of Investigation of a school for training state and municipal police officers created a growing demand for adequate police training and laid the foundation for pre-employment training. Police radio systems now are operating in about 300 cities and 15 states.

Centralized, coordinated, and cooperative purchasing for municipalities made "encouraging" progress during 1935. There are now 229 cities and 36 counties which have centralized purchasing.

A 450-Hp Municipal Electric Plant Makes Good

By C. M. STANLEY

Consulting Engineer, Young & Stanley, Inc., Muscatine, Iowa

THE initial success of the new municipal electric plant at Gowrie, Iowa (population 1,056), is proof that such systems are feasible and profitable in small communities if properly designed and operated. The record of the Gowrie plant, as outlined below, is a partial answer to the question: "How small a community may successfully support a municipal electric system?"

550-HP ELECTRIC PLANT AT GOWRIE, IOWA

The History

The municipal electric plant at Gowrie was placed in operation in September, 1934. Prior to this, Gowrie was provided with electrical service from a private company which supplied the energy from a transmission line. Service was poor and interruption frequent. The energy supplied was of a 25-cycle frequency as compared with the standard 60-cycle frequency normally used. This made the purchase and repair of appliances an expensive and disagreeable matter. A decided sentiment for municipal ownership grew out of these conditions and culminated in definite action, as it was realized that the franchise of the private utility expired in May, 1934.

In September, 1933, the Town Council engaged Young & Stanley, Inc., as engineers on the proposed municipal project. After the report was submitted, the project was approved by the voters (306 for, to 86 against) at an election in November, 1933. In March, 1934, a contract was awarded to the Monroe Electric Co. The load was cut onto the new plant in September, 1934.

The improvements consist of a generating plant and a distribution system. The plant contains two 225-hp Worthington diesel engines, each driving General Electric alternators. This equipment, with the switchboard and auxiliaries, is housed in an attractive brick building. A business office is provided on the front of the building. An oil tank and a cooling tower are located beyond the plant.

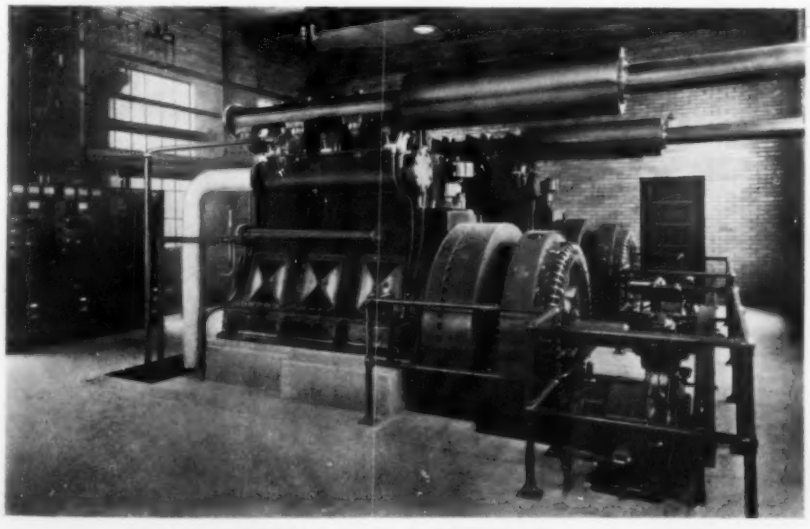
After negotiations with the utility, the existing distribution system was acquired and rehabilitated. It was necessary to change all 25-cycle motors and appliances to permit 60-cycle operation. This was done at the town's expense at a total cost of about $10,000.

Financing

The total cost of the project was $80,000, including the lot, building, equipment, distribution system, appliance change-over, engineering, and legal expenses. The project was financed by the issuance of callable 6 per cent revenue bonds, the first bonds maturing in 1935 and the last in 1947. Interest and principal are payable out of the earnings of the plant, and cannot under any circumstances become a general obligation of the town or be payable by taxation.

Although the plant has been in operation less than 18 months, all the bonds due in 1935 and 1936 have been retired, as well as $2,000 of the bonds due in 1937. Total bond retirements to date amount to $5,500 as compared to maturities of only $500. *From all indications, the plant will be nearly two years ahead on bond maturities by the end of* 1936.

There is shown herewith an operating report for the 12 months ending March 1, 1936. This statement, compiled from information supplied by Superintendent H. O. Hubbell, takes proper account of inventories of fuel oil at the beginning and end of the period, and of prepaid insurance. The statement not only shows total amounts, but also gives amounts per kwh. I wish particularly to thank Mr. Hubbell for information that he has made available for assistance in preparing this article.



TWO 225-HP DIESEL ENGINES AT GOWRIE; 13½ x 17½, 327 RPM

The Service Representative
in the telephone business office greets a young couple who want to have a telephone installed.
MISS BROWN
Good Neighbors
The Bell System serves the whole country, yet it remains close to the people. The people use it. Their savings built it. "It belongs to Main Street."
The 270,000 employees of the Bell System live and work in your neighborhood and in similar neighborhoods in every section of the country. They are good neighbors. Thousands of times each day and night their activities bring friendly aid to those in need.
To every one—to the newlyweds, to the man in the grand house on the hill or the little lady with the shawl—the Bell System offers the same full measure of service.
And seeks to do it always with courtesy and sympathetic understanding—in the manner of a friend.
BELL TELEPHONE SYSTEM

Depreciation

Depreciation has been computed at 4 per cent of the investment in the plant and distribution system on March 1, 1936. This investment is the original cost of $80,000, plus $1,141.14 of additions to March 1, 1936, making a total of $81,141.14.

No depreciation fund has been set up, but all available funds over operating costs and extensions have been used to retire the outstanding bonds. This provides a sure and certain way of caring for depreciation, since it means the definite writing-off of the indebtedness against the plant.

Rates

This fine showing has been made with rates for electrical service that are materially under the average for communities of this size in the state of Iowa. The following comparison shows the costs of residential service under the present Gowrie rates (in effect since March, 1935) with similar costs in Iowa communities of between 1,000 and 1,250 population.

	Community	*Population*	*Amount*
25 kwh			
	Milford	1,062	$1.69
	Strawberry Point	1,128	1.80
	Gowrie	1,056	1.90
100 kwh			
	Milford	1,062	4.58
	Strawberry Point	1,128	4.73
	Lenox	1,171	4.86
	Montezuma	1,057	5.00
	New Sharon	1.052	5.00
	Gowrie	1,056	5.20
250 kwh			
	Montezuma	1,057	8.06
	New Sharon	1.052	8.06
	Gowrie	1,056	8.35

RATE SCHEDULE

Lighting
First 10 kwh per month @ 10c per kwh
Next 40 kwh per month @ 6c per kwh
Next 50 kwh per month @ 5c per kwh
All over 100 kwh per month @ 3c per kwh
Minimum bill $1 per month

Cooking and Heating
First 50 kwh per month @ 4c per kwh
All over 50 kwh per month @ 3c per kwh
Minimum bill $2 per month

Commercial Optional
First 60 kwh per month $4
All over 60 kwh per month @ 4c per kwh

Residential Optional
First 60 kwh per month @ $4
Next 100 kwh per month @ 3c per kwh
Balance kwh per month @ 1½c per kwh

Power
First 10 kwh per hp per month @ 6c per kwh
Balance kwh per hp per month @ 3c per kwh
Minimum bill 50c per hp, but not to exceed 40 hp or $20 per month

Penalty: A penalty of 1c per kwh is added to all bills not paid by the 15th of the month.

Reasons for Fine Showing

1. The plant has had the hearty support of the citizens of Gowrie.
2. The plant was properly designed to meet the requirements.
3. The plant has been capably managed.
4. Accurate records have been kept.
5. A campaign to increase the use of refrigerators and heavy appliances has been successfully carried out.

The financial condition of the plant will improve as bonds are retired ahead of schedule and interest costs are reduced. Negotiations are under way to refinance the outstanding bonds at a 4½ per cent rate, thus further reducing interest charges. There is a trend towards increased consumption and revenue. It is true that maintenance costs will increase, and it is likely that added plant capacity will be required after a few years. However, sufficient increase in revenue is indicated to take care of these items.

OPERATING STATEMENT
YEAR ENDING MARCH 1, 1936

Electrical Energy Sold:	Total Amount	Kwh Sold	Amount Per Kwh
Lighting rate	$ 7,195.17	97,456	$0.0738
Optional (residential)	791.40	17,309	0.0457
Optional (commercial)	3,291.50	66,268	0.0497
Heating rate	456.59	14,224	0.0320
Power rate	4,293.26	112,232	0.0382
Municipal service	1,452.59	60,794	0.0239
Total Energy Sold	$17,480.51	368,283	0.04750
Less loss on accounts	23.49		0.00010
Net Sales	$17,457.02		$0.04740
Plus miscellaneous income	93.36		0.00030
Net Revenue	$17,550.38		$0.04770
Less operating expenses (see statement below)	6,844.86		0.01857
Net Operating Profit	$10,705.52		$0.02913
Less interest in bonds	4,684.00		0.01275
Net profit before Depreciation	$ 6,021.52		$0.01638
Less depreciation (4%)	3,244.65		0.00892
NET PROFIT AFTER DEPRECIATION	$ 2,776.87		$0.00746

Following are costs of generation and distribution:

Generation Expense	Amount	Per Kwh Sold*
Superintendence and labor	$2,873.00	$0.00715
Fuel oil	2,223.85	0.00552
Lubricating oil	144.50	0.00036
Supplies	219.18	0.00056
Insurance	238.40	0.00060
Miscellaneous	32.17	0.00008
Maintenance	12.67	0.00003
Total	$5,743.77	$0.01430
Less distribution losses, 32,871 kwh @ $0.01430	470.06	
Net generation expense	$5,273.71	$0.01430
Distribution Expense		
Superintendence and labor	$ 653.40	$0.00178
Supplies	205.59	0.00056
Truck hire	122.74	0.00033
Insurance	40.60	0.00011
Miscellaneous	78.76	0.00021
Distribution losses (see above)	470.06	0.00128
Total distribution expense	$1,571.15	$0.00427
TOTAL OPERATING EXPENSE	$6,844.86	$0.01857

* Generation unit costs are also unit costs per kwh net generation.

MODEL PERSONNEL DEPARTMENTS

MICHIGAN cities desirous of using the merit system for employing personnel, but hitherto unable to do so because of the cost of its installation, are being given the opportunity through aid supplied by the Michigan Municipal League, the state association of municipalities. The League has arranged for Public Administration Service, governmental consulting and research agency of Chicago, to install model personnel departments in Flint, Dearborn and Saginaw.

The three cities present three different situations and three different problems in personnel administration, according to Charles F. Yard, of the Public Administration Service staff, who is supervising the installations. Saginaw, without a formal civil service commission, is a city manager city, and the personnel unit will operate directly under the manager. Flint, also a city manager city, has an independent Civil Service Commission with the three members appointed, one each by the City Commission, the School Board and the Hospital Board. Dearborn, under one article of its city charter, has set up a council-appointed civil service commission with jurisdiction over all employees except policemen and firemen; and under another section of the charter has provided a separate board for the firemen; but policemen are not covered by any civil service provision.

Public Administration Service will design personnel systems to fit these varying conditions, including provisions for competitive examinations, classification and compensation plans, service rating and other similar devices.

As the final phase of this state-wide program, the Michigan Municipal League is organizing a staff of personnel technicians to render continuous operating services on a cost basis to its member cities.

BURNING DESERT TORTURES TIRES

470-MILE DAILY SPEED RUN SETS TIRE ENDURANCE RECORD

Owner Praises Goodrich Silvertowns

"We operate one of the most unusual truck runs in the country," says Mr. Dale C. Ramsey, owner of the Valley Truck Company, Los Angeles. "Our trucks haul the Los Angeles Examiner to cities in the Imperial Valley. We pick up papers at midnight and deliver them in Mexicali, 235 miles away, before breakfast.

"For three years we have maintained this daily service and have never once been delayed by tire failure. This is despite the fact that, crossing the desert, the temperature will run as high as 130°.

"Incidentally, we have been averaging better than 64,000 miles with our Goodrich Triple Protected Tires."

There's a *real* trucking job for you—one of the toughest on record. Schedules are fast. Curves are sharp. Roads are rough—sizzling hot. And yet Goodrich Silvertowns not only carry the loads without delays—but they set amazing mileage records as well!

Tires that stand up on burning desert runs will certainly handle your job better, too. Why not investigate this money-saving tire? Find out about Triple Protection—the secret of Goodrich performance. Any Goodrich dealer will give you the facts.

HOW TRIPLE PROTECTION WORKS

1. PLYFLEX—distributes stresses throughout the tire—prevents ply separation—checks local weakness.

2. PLY-LOCK—protects the tire from breaks caused by short plies tearing loose above the bead.

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Goodrich *Triple Protected* Silvertowns

SPECIFY THESE NEW SILVERTOWN TIRES FOR TRUCKS AND BUSES

Low-Cost Tar Street Surfaces

By C. H. OLMSTEAD
Consulting Engineer, General Tarvia Department,
The Barrett Company

MANY unsurfaced city streets are well graded and have substantial supporting qualities, making them satisfactory bases for low-cost surfaces. Many are edged with curb and gutters; others are drained by side ditches. Most cities could find a way to surface-treat these streets at little expense and small future maintenance cost, and provide the people using the street with a low-cost surface of pleasing appearance, dustless and with good riding qualities.

Property owners would gladly pay their share of a low-cost surface if they were given encouragement by the city officials and if some definite plan were worked out by which they could secure the advantage of a surfaced street within their ability to pay.

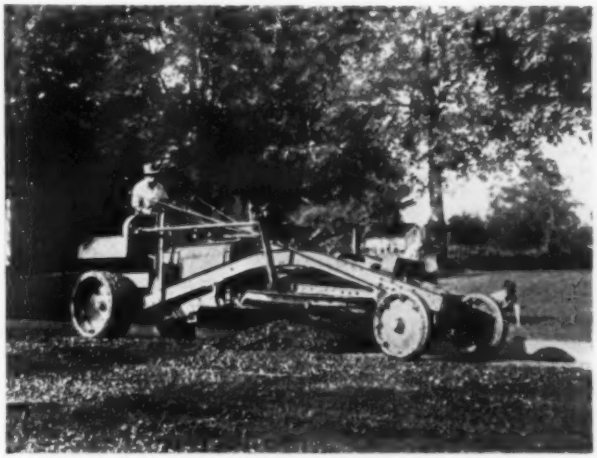
Many such low-cost surfacing projects have been set up under the various relief agencies and in many instances the property owners have organized and gladly arranged to share part of the cost. More of this type of city street work would be done if the property owner could be brought to a realization of how little this type of street surfacing costs, in terms of front foot of property.

Preparation of Streets for Surfacing

When a street has sufficient road metal on it and is in fair condition as to grade and cross-section, the street should be worked with a blade grader in order to smooth the surface and take out small irregularities. The surface can then be lightly sprinkled and rolled or traffic allowed to consolidate it. Any low spots should be built up to grade with any good available road metal such as gravel, chert, slag or crushed stone.

Single Surface Treatment on Tar Prime

When the road has been consolidated, the dirt and dust should be broomed off. The surface is then given an application of 1/3-gallon per square yard of tar prime, a light tar, which penetrates into the old surface and sets up. This is followed the next day by an application of heavy surface treatment tar at the rate of 1/3-gallon per square yard and immediately covered with about 30 pounds per square yard of stone chips, slag chips, or pea gravel. The cover material is lightly broomed to secure a uniform distribution and the surface lightly rolled.



SPREADING A TAR MIX WITH A ONE-MAN POWER GRADER

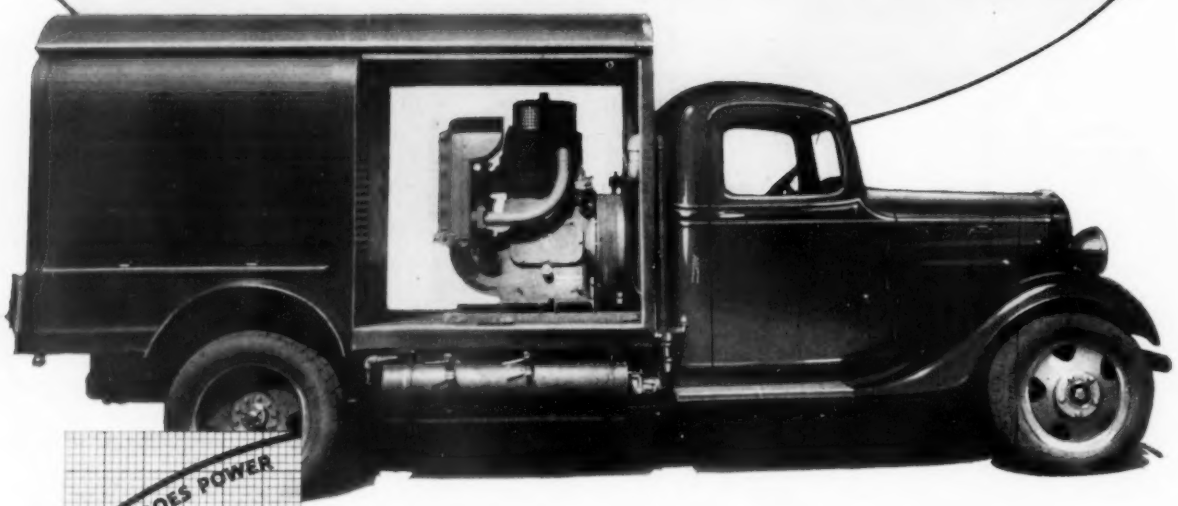
The cost of this work ordinarily will be about 20 cents a square yard and in terms of per front foot, for a street 24 feet wide, 26.6 cents, and in terms of a 50-foot lot, $13.30. All costs per front foot and per 50-foot lot, given later in this article, are also based on a 24-foot width of street surfacing.

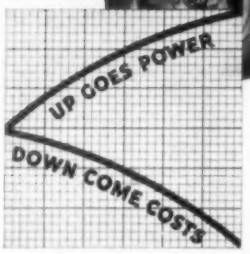
Double Surface Treatment

A better, but still economical, type of surface can be constructed by similar methods, using two applications of surface treatment tar on a tar-printed base covering the first application of 1/3-gallon per square yard with a

A TAR RETREAD STREET IN SMETHPORT, PA.

CHEVROLET TRUCK ECONOMY is a DOLLAR SAVER ON THIS JOB





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CHEVROLET

Mention THE AMERICAN CITY—it helps.

larger size chip, and the second application of from ¼-gallon to 1/3-gallon of tar per square yard with a smaller chip.

This type of surface can be built for about 30 cents a square yard or 40 cents a front foot, or $20 for a 50-foot lot.

Retread Surface

Tar retread or mixed-in-place pavements offer an excellent type of city street surfacing. This type of surface is made by spreading graded crushed aggregate 2 inches thick when compacted on the tar primed base. Retread tar or hot surface treatment tar is applied at the rate of 0.9-gallon per square yard and the crushed aggregate and tar are mixed on the street by blade graders or retread machines. When homogeneous, the mixture is spread out uniformly to cross-section and rolled. During the rolling, chips are lightly spread on the surface sufficient to fill the surface voids and broomed around. The surface is sealed with 1/3-gallon per square yard of surface treatment tar and lightly rolled. Hot surface treatment tar is the best grade of tar to use in summer for city street work, for it can be mixed quickly and rolled immediately.

The cost of this type of surface varies with the availability and cost of the crushed aggregate and usually amounts to 50 to 60 cents a square yard, or 66 to 80 cents a front foot, or $33 to $40 per 50-foot lot.

Gravel Mulch Surface

Where local gravel is available, the gravel passing a 1-inch screen can be used as aggregate for the gravel turnover or mulch method of street surfacing. Two and one-half inches loose depth of gravel is spread over the street and smoothed out uniformly. One gallon of retread tar or hot surface treatment tar is applied per square yard, and the gravel and tar mixed with blade graders or retread machines. When homogeneous, the mixture is windrowed, exposing sections of the base. The exposed base is given an application of 0.2- to 0.3-gallon per square yard of the same grade of tar used in the mix and the windrowed mixture spread over the fresh tar. This operation is repeated until the entire base has been so treated. The mixture is then spread out and leveled up with blade graders and rolled. A seal coat, as previously described, is then applied, covered, and rolled.

When cheap local gravel is available, this type of street surface can be very economically constructed, costing between 35 and 40 cents a square yard, 46 to 53 cents a front foot, or $23.00 to $26.50 per 50-foot lot.

Plant Mixes

Frequently it is possible for cities to handle the mixed types of low-cost street surfaces more economically and efficiently by mixing the tar and aggregate in a regular paving plant or concrete mixer, hauling the mix to the previously primed street, and spreading to the desired thickness, either by hand or by road machines, followed by the usual rolling. Heavy surface treatment tars make excellent binders for low-cost plant mixes, and a better control of gradation of the aggregate and amount of tar binder can be obtained.

Sealing material, consisting of fine graded chips mixed with the same grade of tar is often used. This fine premixed seal should be rather rich in binder and can be roughly spread by hand and uniformly distributed with a blade grader. The surface is then rolled. A minimum of 35 pounds per square yard should be used for a seal coat with premixed material. While this type of seal provides a pleasing appearance and a non-skid surface, a liquid tar seal covered with fine chips affords a better waterproofing of the surface.

The cost of this type of surface of thickness comparable to the street-mixed types previously described under ordinary conditions will be about the same per square yard, per front foot, and 50-foot lot.

A PORTABLE PLANT FOR TAR MIX SURFACING

Low-Cost Street Maintenance

The maintenance of these surfaces consists of patching occasional breaks and a light seal coat application every few years as required.

There are numerous cities which have constructed the above types of low-cost tar street surfaces. Annual costs for maintenance have been from 2 to 3 cents a square yard, which is considerably less than the interest charge per square yard for high-type pavements. Some cities, using only tar surface treatment, have average costs over a period of years of from 3 to 5 cents a square yard per year, including the cost of the original treatment.

The maintenance of any of the above types of low-cost surfaces constructed on an adequate base should not exceed the cost of a well-maintained and sprinkled unsurfaced street.

How can property owners secure this economical type of low-cost surfacing? It can be done by petitioning the City Council to make the necessary arrangements either to do this work with their own forces and equipment or to draw up specifications and let this work by contract. The property owner can afford to pay for these low-cost surfaces which have already proved their value on state highways. The property owner and city official should realize that when constructed as a light-traffic residential city street, on an old, firm, well drained base, with the edges confined and protected by a curb and gutter, this low-cost surface should function with much less care and maintenance than a like surface on a state highway.

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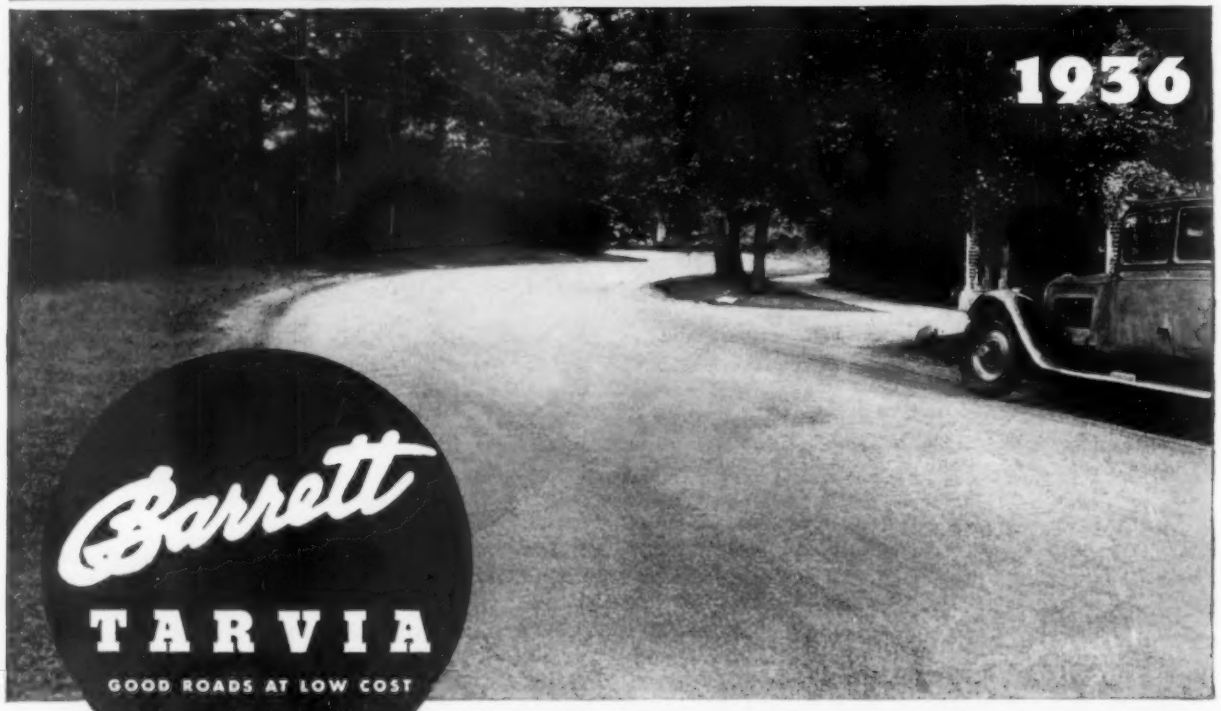
Sheridan Road, Hubbard's Woods, Winnetka, Illinois. Tarvia since 1907.



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Recreation Possibilities of a Typical Small River Valley

By HENRY S. CURTIS
Ann Arbor, Mich.

THE Huron River is not navigable for commercial craft, and its significance for power is inconsiderable, but in the areas that are not polluted by sewage it is the chief center of recreation of the people of the valley. As such, it has all the characteristics of a long park or chain of parks. In this state a river is held to be navigable if it was used for floating logs in pioneer days. There is no evidence that the Huron was so used. It was, however, a main highway of the Indians in crossing the state and was also used extensively by the early settlers. The U. S. Land Office Plates show that the river was meandered in the early surveys, and the Conservation Department regards it as navigable.

The United States Government has been ready to spend immense sums to improve rivers that by any stretch of the imagination might be regarded as navigable for commerce, but thus far very little has been spent to improve rivers that are navigable only by pleasure craft and whose value is recreational, even though the values arising from these attractions and opportunities may far exceed any values arising from the commercial navigation of streams.

But in an age of increasing leisure, larger and larger opportunities for its profitable use must be provided. It is time our statesmen and planners began to consider this great undeveloped resource that lies at the very doors of half of all America.

Adverse Conditions

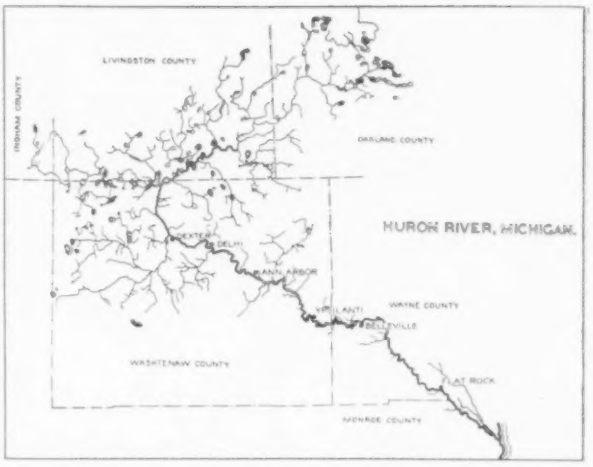
From our study of the Huron River valley it would appear that the river offers nearly every form of recreation that is to be found anywhere, and that the recreation of the people of the valley centers along the stream. But there are certain conditions that affect this use adversely, as there are others which have a beneficial effect. Among the adverse conditions may be mentioned the following which affect unfavorably nearly every form of use:

There are a number of the most attractive lakes in the county that are almost unused, because they are off the highway or on some little-traveled back road. The same conditions are found on some of the most attractive parts of the river.

The railroad is one of these unfavorable conditions. It affects recreation unfavorably in three ways: by shutting the people off from one side of the river most of the way from Dexter to Ypsilanti; by its low bridges, which require portages, and by its preventing the Edison from building its dams higher and so enlarging its ponds.

Undoubtedly, pollution is much the most serious handicap to recreational use. The river between Ann Arbor and Dexter is the most intensively used recreation area in the county; but the section below Ann Arbor, which is in many ways a more attractive section, has been almost entirely unused on account of the sewage.

The motor boat should be forbidden on small ponds and lakes. It is detrimental to nearly all forms of recreation. It stirs up the mud from the bottom, so that water plants do not get enough sunlight to make a good growth. It covers fish beds with mud, so that the eggs do not hatch. It scares the fish from the fisherman. It drives away the water fowl. It muddles the swimming beaches and often makes swimming dangerous. It disturbs the quiet which is a major charm of stream and shore, and it cheats the owner out of the exercise of paddling or rowing, which is one of the chief objectives of an outing.



THE DRAINAGE BASIN OF THE HURON RIVER CONTAINS 735 SQUARE MILES
One hundred of the 160 lakes drain directly into the river

Favorable Conditions

There are also certain conditions which affect the use of the river favorably, and these also apply to nearly all forms of river recreation.* Among these we may mention the following:

Accessibility.—The nearly maximum use of the facilities along the Drive are a sufficient illustration.

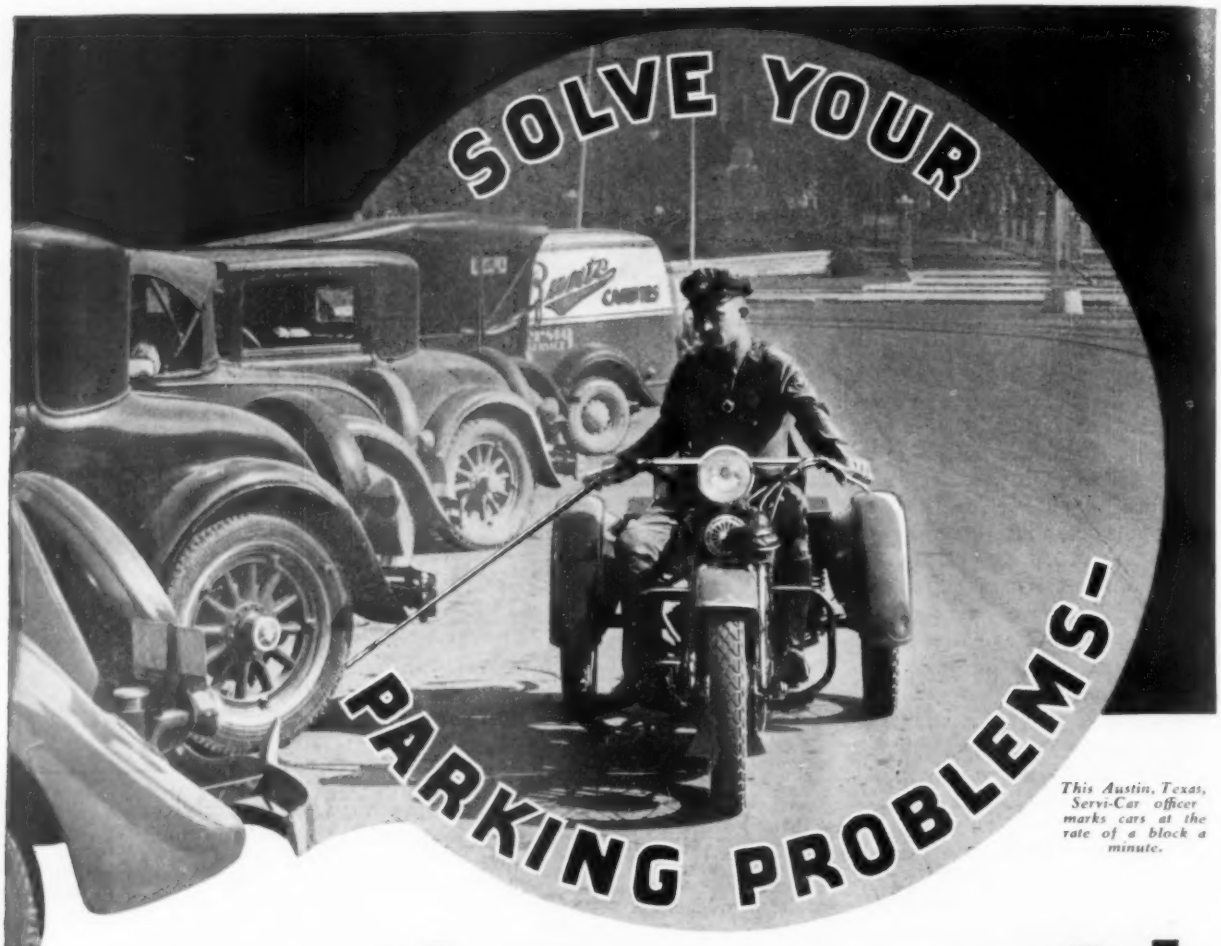
Beauty.—Every one desires his outing in beautiful surroundings, and even if he is only fishing from the shore, the beauty and quietness of the scene have a constant even though subconscious influence upon his enjoyment. This is still more true if he is hiking or driving or rowing or picnicking or camping.

Wild Life.—Every one enjoys watching the birds and animals along the river. If they are also tame, they are yet more appealing.

Condition of the Water.—This means not only the absence of sewage, but the water should be clear enough so that one can scan the bottom and watch the fish.

The Ponds.—Probably the largest single element in the

* See "A Dammed River May Make a Resort," by Henry S. Curtis, in THE AMERICAN CITY for March, 1935.



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The Police Motorcycle

whole river situation is the size of the ponds. A good-sized pond tends to prevent floods, has many of the characteristics of a lake, and may make a resort. It is better than a small pond for residence, swimming, skating, boating, fishing, camping and picnicking, and for power. It would be an advantage if each pond might back up to the dam above, and if certain dams were eliminated entirely so as to make larger ponds.

The Financial Value

Recreation is held to be the second largest crop of Michigan. The out-of-state tourists alone are reckoned to bring into the state two or three hundred millions of dollars a year. As to what the tourist trade of Detroit is worth to the upper part of the state, I have never seen any estimate, but the tourist trade of the home people is probably worth more than the out-of-state trade.

In considering the financial side for the Huron valley, the sewage has probably been the greatest handicap and the railroad next. We may glance at three different groups.

Residences.—The area at Barton Hills undoubtedly has a much higher value than the land back of it. This value is in part due at least to the outlook over the Barton Pond. The beauty of the outlook, the absence of sewage, the size of the pond, each add to residential values.

The Community.—It is the same question as home trade and home travel. If the community has many attractions, the people tend to spend their money at home and so keep up the finances of the community. Otherwise this money goes to recreation places elsewhere, and the money is lost to the community. Probably every house in Ann Arbor is worth a little more on account of the river attractions.

The Tourist.—The Huron has not thus far made a great appeal to people from the outside, though there are a good many from the Detroit area who come here for picnicking and fishing. It seems likely that this will increase largely with better highway and Drive connections. Many think this undesirable. It is much less important than the use by the people of the valley; but not altogether to be frowned upon, provided facilities accommodate it.

We are only just beginning to realize the value of the tourist. Probably the people who will come to Ann Arbor to hear the Carillon will spend more money here within the next four or five years than the Carillon and Tower will cost, and they will go away to advertise Ann Arbor and the University over the United States and the world.

The points of greatest tourist appeal in the valley are the University and the various projects of Henry Ford. The popularity of the Saginaw Forest, however, indicates that a demonstration forest in the valley might be popular.

The Lake Attractions

One of the attractions of any lake is its wild life. There are probably at least ten persons who enjoy watching the birds for every hunter who wishes to shoot them. There were 4,738 hunting licenses issued in Washtenaw County in 1934 to 70,000 people. The ducks, herons, kingfishers, kildeers, gulls, terns, swallows, and the songsters around the edges add much to the attractiveness of the lakes.

A lake without woods or at least a fringe of trees seldom becomes a resort. The summer cottagers are nearly all city people, who want to get back to nature. Most of the lakes of the Huron valley might be greatly improved by the judicious planting of trees at certain places and especially willows at the water's edge. A lake gives distant vistas and effects with reflections that cannot be had on the land. In the fall the blaze of color from the maples and other trees may turn the lake into a fairyland.

Most of the lakes have the yellow water lilies, but there is in general a scarcity of the much more beautiful white lilies. There are many hardy and beautiful water plants which would probably do well in most of the lakes and furnish food for water fowl as well as make the lake beautiful.

The summer colony on a lake is made up mostly of city people living in the country. They are not voters in the district. There is no way at present by which they can secure their own peculiar interests through legislation. Some of these special interests are the following: the maintenance of the water level, keeping up the supply of fish, plantations to make the lake beautiful, protection of the wild life, securing adequate and satisfactory bathing facilities, roads, groceries, and mail delivery.

There are three ways in which these improvements might be effected. A lake area might be developed like a restricted residence suburb with certain restrictions and provisions going with the property. The property might be made into a separate taxing body, which is essential if it is not to have over-taxation without representation; or these joint problems could be handled through a lake improvement association, which is practical in any place where leadership is available. Since it is these improvements that largely determine the value of the property, it is strange that so few such associations have been formed.

Common Interests Require Common Effort

There can be little doubt that anything that adds to the beauty, attractiveness and opportunities for enjoyment which the river offers will add also the value of all the property in the valley. The entire cost of putting in a city parkway is often assessed against adjacent property, and it is usually found that the increase in value much more than covers the cost. It would seem that the same argument should hold for making a river attractive.

On the whole, it would appear that the people living in a certain river valley have a number of common interests, that these interests will not be realized unless there is some common effort toward realization, and that the significance of the common interests warrants some form of organization of the valley such as the TVA or a metropolitan park district with an executive officer in charge.

Considering the financial and social importance of recreation, and that its values are often lost through lack of organization and leadership, the suggestion seems rather patent that more thought and planning should be given to it by the state than has thus far been done.

If we were to suppose the state to be represented by some vast and philanthropic individual, who owned all the land and the waters, we may be sure that our river valleys would be developed in a way scarcely conceived of at present. Recreation is surely a large enough interest to warrant a state director, if not a separate state department, with two major aims: to provide first for the home folks and second for tourists.

EDITORIAL NOTE.—The Guide to the Valley of the Huron River with Map and Plan for Its Development, now in preparation, will contain 27 studies of various features of the section, by authoritative writers. Three of the studies—The Ford Projects; The War Department and Navigation; and Recreation Present and Possible—are by the author of the foregoing article.

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Cities Are Adopting Modern Office Practice

A Good System Has Become Necessary to Municipal Procedure

MUNICIPALITIES, by and large, have now arrived at the point where the industries were when the magic word SYSTEMATIZE flamed across the business sky. A number of cities installed machine-accounting systems; others are weighing the advantages. Billing and addressing machines are familiar appliances in many water and electric departments. Among the cities that have placed their tax departments on a machine basis are Detroit, Cleveland, Cincinnati, Milwaukee, Chicago, Newark, Louisville and Toronto. The trend is by no means confined to the larger cities. An editorial in the *Michigan Municipal Review* for March, headed "Modern Accounting a Success in Saline," tells how this community of 1,009 population incorporated as a city and installed a modern system of record-keeping in 1933:

"Under the old system the city records consisted of a duplicate set of books, one for the clerk and one for the treasurer, in which only cash receipts and disbursements were recorded, and a memoranda accounts receivable ledger for water consumers. The officials were able to determine at any time how much cash the city had on deposit, but this was their only yardstick of the city's finances.

"An annual report had been prepared at the end of each fiscal year, but this was no more than a transcript of the information shown on both sets of books, as it only listed, in chronological order, the individuals from and to whom cash was received and disbursed and the amounts involved in each transaction.

"The new double entry system consists of one set of records under the supervision of one officer, the clerk. It incorporates all of the basic principles of good municipal accounting, provides accounts for such assets and liabilities as cash, taxes receivable, accounts receivable, bonded debt and surplus; a detailed classification of receipts and disbursements and a complete budgetary procedure.

"The system was designed to meet the specific requirements of this small city and to supply its officers with financial data so essential to the proper guidance of city affairs. The recent report on the civic affairs of this city indicates how well this system is serving its purpose."

New York City a Contrast

The Board of Taxes and Assessments of New York City is said to be almost unbelievably behind the times in its continued complete subjugation to hand methods. A report issued March 28 states hopefully that modernization or mechanization of procedure has been recommended in a report to the Mayor and may come to pass during the next two years. Though as yet a dream, it is possible that, like some other day dreams, this one will actually be realized. To achieve this, however, vigorous leadership must be exercised and official sanction must be given. At present, practically everything is against the plan, except the one fact that it has now been placed on record. It can be pointed to, and of it can be said: "This should be done."

The plan includes (1) the preparation and filing of data for each of 812,000 parcels that must be examined annually, (2) machine accounting in place of hand-written recording of more than 7,000,000 statistical calculations and a like number of descriptions. "The reproduction of these records," says the report, "can be accomplished in an accurate and economical form. By the introduction of modern accounting and recording methods, it will be possible also to analyze the huge mass of assessment data collected each year by 114 assessors and their clerks." These assessors, by the way, are doing an excellent job under great difficulties and without having even a manual to help them. A modern system would relieve them of an immense amount of drudgery and permit them to devote more time to their profession of assessing.

The magnitude of the job is indicated by the department's annual production of 1,367 books measuring 21 x 17 inches and weighing many pounds. These hand-written books comprise 125 field books, 621 tax rolls, and 621 annual record books. There are more than 20,000 of these volumes, dating from 1791, "stored in dusty basements and bins of the various borough offices. A complete inventory of these records was made for the first time. The most valuable volumes were put in safe keeping. The rest are inspected and rechecked each year."

The department spends about a million dollars per year, of which about 98 per cent is for salaries and zero for equipment. There are ancient desks and stools, and what goes on smacks of the counting houses of Charles Dickens.

The entire department needs to be modernized. As one official says, this will take time, energy and money. It will also take vision and decision. In fact, all these qualities are possessed by Mayor LaGuardia plus a human understanding of employee psychology. If those who recommend mechanization of the Department of Taxes and Assessments are determined to achieve it, they will incorporate their recommendation within a final plan that will not only solve all the physical problems but will definitely establish the future position of every official and employee now on the department payroll.

The complete solution of this tremendous problem in a workable and painless manner would doubtless be of considerable assistance to other cities also desirous of making the dream of efficient assessing, tax collection and accounting, and record keeping, come true. Such a department collects most of the money that a city uses. It ought to be on its toes.

CINCINNATI RETAINS PROPORTIONAL REPRESENTATION

BY a rather narrow margin, the citizens of Cincinnati at the local election on May 12 voted to retain the Proportional Representation method of electing the City Council. The attempt of anti-charter forces to abolish P. R. was defeated by a vote of 36,650 to 35,819.

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Keeping within appropriations is an important problem which confronts those responsible for expenditures of municipalities, schools, hospitals and other public institutions. Recent modernization of municipal accounting has been due to an increasing demand for more accurate and detailed reports of expenditures. Intelligent budget planning requires accurate comparative detail of previous years' expenditures. Current budget control demands daily knowledge of appropriation balances.

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Forward Steps

Reported by
Municipal Officials, Chamber of Commerce Executives, and Others

Kansas City's New Municipal Auditorium

KANSAS CITY, MO.—The new auditorium in Kansas City is planned to meet all requirements of adaptability and utility in serving the country's great conventions and exhibits within a modern structure of striking architectural proportions, beautiful interior, maximum comfort regardless of weather conditions, and fine equipment for its varied uses.

The different parts of the building can be mutually exclusive when individual use is desired, yet can become a great entity when the whole structure is needed for one function. From the Grand Foyer one may find access to every part. The theatre section, on the north, contains the Foyer, the Music Hall, the Little Theatre, the Assembly Room, and smaller meeting rooms. On the south are the arena, the exhibit area, the arena committee rooms, and the office and service facilities. The natural slope of the land provides street-level entrances to the Grand Foyer and both exhibition levels. Stairways and large high-speed elevators serve the various floors of the theatre section, and the different levels of the arena section are joined by comfortable ramps and stairways.

The arena has a seating capacity of 13,345: permanent seats in balconies and boxes; movable seats on floor. It is amphitheatre in type, and can also be equipped with a full stage at the south end to form a theatre seating 11,000 people. It has no post, pillar or other obstruction. Its acoustics are excellent, and programs given there can be heard throughout the building if desired. It is entirely surrounded by a wide promenade, in which are complete service facilities, including an emergency hospital. The Music Hall has permanent seats for 2,562; the Little Theatre, 1,200, and the Assembly Room, 500, movable chairs. The public address system and the radio equipment are unsurpassed in any other auditorium in the country.

The exhibition area furnishes a total of 91,212 square feet: 62,522 of this on the exhibition floor, and 28,800 on an open mezzanine. It has every arrangement for convenient access of exhibit material from street level to the exhibition floor and the mezzanine. And the building is in the heart of downtown Kansas City, within three blocks of all the leading hotels.

The Municipal Employes Club of Fort Wayne

FORT WAYNE, IND.—The *Municipal Booster* is published each month by the Muncipal Employes Club of Fort Wayne. Both the Club and the publication have proved decidedly helpful in the promotion of efficiency and cooperation among the city employes, and through these instruments intensive education on city government among a larger number of the citizens has been made possible.

The Club was formed early last fall. While the idea of an employes' organization is old to business and industry, it is new to city government, and in this case, the Club, formed at the suggestion of a group of enthusiastic employes, is accomplishing its announced purpose of promoting good public service and the mutual benefit of the individual members—recreational, educational, civic, and charitable. The membership is purely voluntary and includes over 95 per cent of the more than 800 civil and municipal utility workers of Fort Wayne. It has an official organization, with by-laws and a program of activities. One of its major purposes is to dignify in the mind of the city employe his service to the public, and to this end educational classes and lectures have been arranged for the various groups of employes.

Each month the *Municipal Booster* gives new publicity to facts regarding the city government and administration, and to news of the activities of the various city departments. One of the notes most often sounded is that of economy; consequently, it was necessary to make the production of the *Booster* itself as economical as possible. To accomplish this, the Mayor appointed an editor from the ranks of publicity utility employes, who supervises the preparation and distribution of the publication in addition to his regular duties. The entire job is done each month with city equipment by city employes, and the cost to the municipality is small. All city employes receive the publication, and a mailing list has been compiled of several hundred civic-minded citizens who have asked to receive it regularly.

The place of the January issue of the *Municipal Booster* was taken by a 12-page pamphlet containing the Mayor's address on "The Business of City Government," presented before the Quest Club of Fort Wayne on January 10. Among the facts relative to the city's expenditures set forth in this address is a breakdown of figures showing the per capita cost of the various city services, and enabling the taxpayer to judge whether he is paying for more than he gets. Some of these facts are found each month in the employes' publication.

In its regular form the *Municipal Booster* appears in eight mimeographed pages, full of news of city administration affairs and personal items, with a department of "Comment and Comedy."

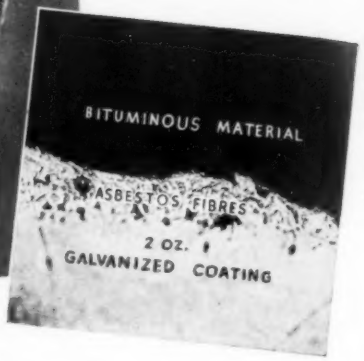
HARRY W. BAALS,
Mayor.

THE NEW MUNICIPAL AUDITORIUM IN KANSAS CITY

The Friendly City of Quincy, Mass.

The new citizen of Quincy and his family receive a letter of welcome from Mayor Thomas S. Burgin soon after their arrival. Enclosed in the envelope are more than a dozen gift cards entitling the recipients to a variety of commodities and services from business organizations in the city. Such a welcome tends to foster a spirit of loyalty to the new home.

E. J. MACEWAN,
Secretary, Quincy Chamber of Commerce.



Left: The body of King Tut-Ankamen, preserved in asphalt, has withstood decay for 3000 years.—(Courtesy World Wide Photos). *Right:* As you can see from this photomicrograph, the bituminous material is actually "bonded" to the pipe, by means of asbestos fibres which are embedded in the galvanized coating.

CORROSIVE SEWAGE won't harm This Improved Corrugated Iron Pipe

● Engineers have long realized the value of bituminous coatings as a means of protecting metal pipe against severe *corrosive* conditions. Pure bitumen, you know, is impervious to moisture and it resists more acids and alkalies than almost any other substance. Remember, too, that the smooth, thick *pavement* in the bottom of Armco Paved Invert Pipe is a special grade of pure bitumen—proved by 10 years of sewer and drainage service.

Now . . . Armco engineers have discovered a way to "bond" a complete bituminous *coating* to the pipe in such a manner that it *will stick indefinitely*. This new process, known as Asbestos Bonding, also widens the plastic range of the bituminous material—as much as 50 per cent.

No wonder *Asbestos Bonded* Armco Paved Invert Pipe appeals so strongly to municipal engineers. Besides being permanently sealed against corrosive influences, this pure Ingot Iron pipe offers many other advantages that simply cannot be obtained with heavy, rigid materials.

Complete data on this improved sewer pipe is available to you in a new 12-page bulletin. Just mail the coupon for your free copy. Armco Culvert Mfrs. Association, Middletown, Ohio.

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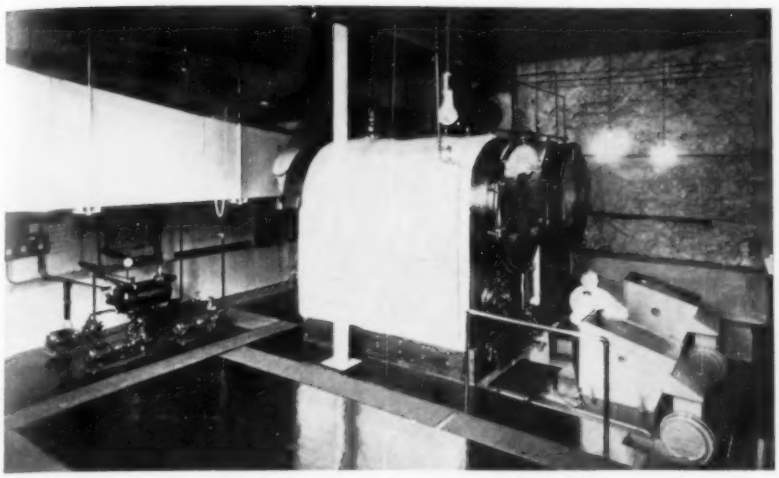


SPOTLESS BOILER ROOM IN CENTRAL HEATING PLANT, KINGSTON, NEW YORK

Everett Roosa, plant engineer, standing beside stoker

Automatic Stoking Reduces Kingston's Coal Bill

KINGSTON, N. Y.—In 1929 we were hand-firing the two 94-hp boilers in our municipal heating plant with poor results, burning 417 tons of anthracite a year at $6.75 per ton, an annual bill of $2,815.

The officials of Kingston, after conducting a thorough investigation to determine methods and equipment for reducing the cost of heating the various buildings, decided on the Iron Fireman because of its sturdy construction and simple mechanical operation. We discontinued one of our boilers. Using only the new boiler, we burned only 300 tons of stoker coal at about $5 per ton, costing $1,612, producing a saving of $1,203 over the previous method.

After our old armory was remodeled into a municipal auditorium, in the winter of 1933-34, a second No. 4 Iron Fireman was installed in place of the discontinued old boiler. At present we are heating, from this central plant, the municipal building, auditorium, city hall, central fire station, and public health laboratory, all located as far as 700 feet from the plant. Last winter these buildings were heated comfortably with 465 tons of bituminous coal at a cost of $2,393.

The Iron Fireman is an underfeed stoker. A slowly revolving worm conveys the coal from the bin to the underside of the firebed. At the same time, a centrifugal fan creates a forced draft. As the coal slowly rises toward the fire, it becomes heated and gives off gases which mix with the fan air and burn. As the coal continues into the fire, it continues to give off its gases evenly. By the time the coal reaches the incandescent top of the firebed, nothing but carbon and ash remain. The carbon is completely consumed. The ash falls away and fuses into a clinker easily removed. The firebox temperature is in the order of 2,500 to 3,500 degrees, compared with 2,000 degrees for hand firing. Everett Roosa, our engineer, is so enthusiastic over the new equipment that he has had the boiler and boiler-room painted a light color to emphasize the cleanliness of stoker firing.

Our heating plant is always open for public inspection and its excellent record is a source of great satisfaction to the city's officials.

CONRAD J. HEISELMAN,
Mayor.

Centralizing Welfare Work in Memphis

MEMPHIS, TENN.—Relief activities in Memphis, Tenn., are coordinated and operated by a Welfare Commission of prominent citizens, who are appointed by the Mayor and serve without compensation. Its creation in December, 1935, resulted from the city government's recognizing the need for centralizing welfare work under one group which can cooperate with all Federal, state, and local agencies in furthering the public good.

The Commission has been very active, supplying food orders, clothing, and fuel to more than 15,000 persons since January 1. This spring it is homesteading families on county land, supplying them with seeds, canning equipment, and food while crops are being made. Whatever these families raise and can will be theirs. Another project is vegetable growing and canning for next winter's needs, with $8,000 allotted from WPA funds. The Commission is planting 100 acres of sorghum, 100 of sweet potatoes, 50 of corn, 25 of cabbage, 115 of tomatoes, and some land in beans and okra for use in soup mixture. It has its own cannery.

The Welfare Commission's financial support is divided between the city and the Tennessee Welfare Commission. The city has set aside $20,000 in its 1936 budget for welfare work, which covers salaries of a paid administrative staff, social service and administrative offices, warehouse quarters in the municipal auditorium, maintenance of a woodyard where relief clients exchange labor for fuel, and all overhead expenses, such as light, water, telephone, and heat.

The Tennessee Welfare Commission contributes surplus food and clothing commodities supplied by the Federal Government and also pays approximately $4 per relief case and the salaries of the social case workers.

The warehouse at the municipal auditorium is used to handle food, clothing, and other supplies. Relief workers weigh and package the groceries, which are made up into rations approved by the Health Department as a balanced diet. Much clothing has been obtained from local WPA garment-making projects and from donations by citizens. Case workers distribute supplies to their clients through fifteen centers located at fire stations and in vacant stores, with the aid of firemen and Park Commission employees.

When the recent tornado left disaster in its wake in and around Tupelo, Miss., the Welfare Commission aided Mayor Overton of Memphis in rushing train-loads of doctors, nurses, medical supplies, and clothing to the stricken area. Those recovering in Memphis hospitals later were helped to return to Tupelo.

Beside the citizen members of the Commission, who number 13, the Mayor, the County Commissioner, and the city's Commissioner of Public Utilities, Grounds and Buildings are ex-officio members.

RALPH PICARD,
Commissioner of Public Utilities, Grounds and Buildings.

Low-Cost Medical Care Through Group Clinics

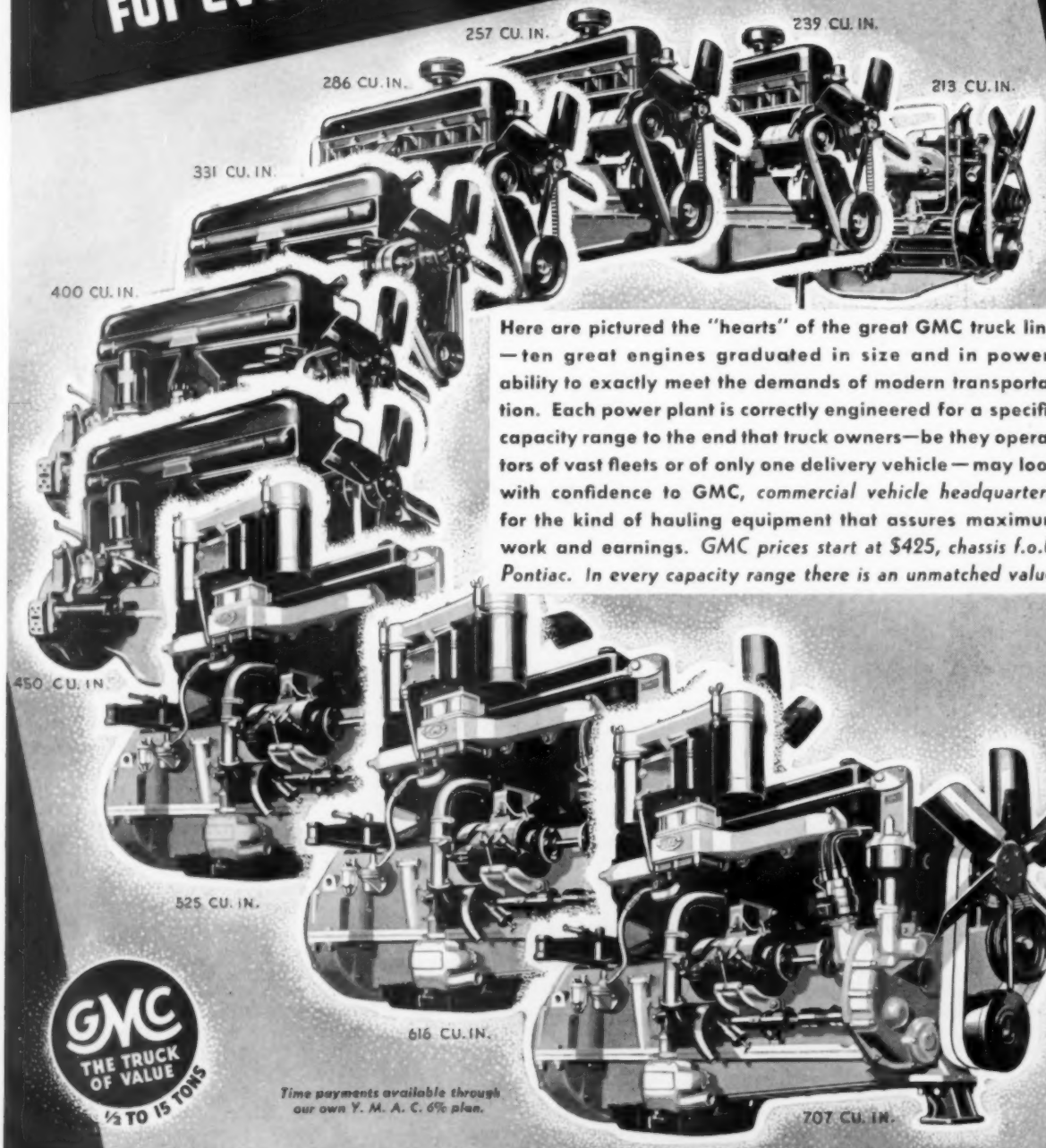
FOR seven years most governmental and some private employees in Los Angeles County, California, have rid themselves of worry about doctor bills by paying $2 a month to their own clinic. The planning and the progress of this low-cost medical care are described in the pamphlet, "The Ross-Loos Clinic—a Pioneer Venture in Group Medical Practice for Public Employees," issued April 24 by the Civil Service Assembly of the United States and Canada.

The story goes back to 1928, when a number of employee-benefit associations in Los Angeles County first recognized the need for a plan to bring adequate medical care within reach of their pocketbooks. There were then in this community of 4,700,000 people five political units and at least five private and semi-private corporations employing a large number of low-salaried workers.

The Los Angeles Bureau of Water Power took the lead in asking two Los Angeles physicians, Dr. Ross and Dr. Loos, to form a group clinic for the purpose of caring for workers and families by monthly contract. The clinic was opened in April, 1929, with three physicians on the staff. By the end of the year there were 8 doctors and 3,963 clients. For his $2 the subscriber gets free hospitalization for 90 days, and free laboratory, X-ray, physical therapy or ambulance service.

From April, 1929, to October, 1935, the number of subscribers grew to 14,076, and there are now 41 full-time physicians

Power
for every transportation need



Here are pictured the "hearts" of the great GMC truck line—ten great engines graduated in size and in power-ability to exactly meet the demands of modern transportation. Each power plant is correctly engineered for a specific capacity range to the end that truck owners—be they operators of vast fleets or of only one delivery vehicle—may look with confidence to GMC, *commercial vehicle headquarters,* for the kind of hauling equipment that assures maximum work and earnings. *GMC prices start at $425, chassis f.o.b. Pontiac. In every capacity range there is an unmatched value.*

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Time payments available through our own Y. M. A. C. 6% plan.

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on the clinic staff. Five branch offices have been opened for distant localities, with fifty doctors serving these patients.

The founders of the clinic receive 27½ per cent of the net profits. Other doctors are on salary, but also share in the remaining 72½ per cent of the profits. Minimum salaries are $3,600 a year, which is estimated to be $1,100 higher than the income of one-third of all private physicians in 1929.

Toward the end of 1935, owing partly to increase in the cost of medical supplies, the contract had to be revised, to provide for serving dependents of subscribers on a fee basis. Practically all the "old subscribers" signed. Despite attacks of some members of the medical profession through organized protest and legislation, the clinic has seen demand for its services grow, and it has been given the approval of the American Medical Association.

Unfavorable Effects of Tax-Limit Laws

INCREASED experience with laws limiting the tax on real estate reveals more clearly their failure to equalize the tax burden, according to the revised edition of "Property Tax Limitation Laws," issued May 4 by Public Administration Service, Chicago. When the first edition of the pamphlet was issued, early in 1934, the consensus of the 24 contributors was that tax limitation laws, prescribing over-all limitations in eight states, and partial limitation in many others, tended to cripple municipal services, hurt municipal credit, and add to the difficulties of running local governments. Proposals for such limitations have been widespread since the depression.

"Case histories" of states with over-all limitations are cited in the new pamphlet as proof of unfavorable effects of the laws intended to lighten the burdens of taxpayers who hold real estate. These are among the results noted:

All the eight states which have blanket tax limits have adopted a sales tax (six of them since the limitation measure went into effect.) The tax burden has thus been shifted from the home owners to the consumers, largely persons of small income.

Indiana, according to the Director of the Governmental Research Bureau of the Indianapolis Chamber of Commerce, has not experienced real tax limitation, because the "emergency" clause written into the 1933 law has been liberally interpreted. Here the county tax adjustment boards, set up under the tax limitation law, may "allow" any rate beyond the tax limit that is needed when a municipal corporation is in a pinch.

In Michigan, says Harold D. Smith, Director of the Michigan Municipal League, the tax-limit law "has tangled property-tax procedure and made equalization impossible; it has reduced budget-making to a hollow form; it has stopped all short-term credit and long-term capital borrowing; it has forced the state to abandon the levy on property and to adopt a retail sales tax; has stimulated a movement for an income tax although greatly complicating the drafting of a constitutional amendment to permit such a tax; and it has forced the schools into the position of demanding a greater state equalization fund or closing their doors."

Effects in Ohio have included a 3 per cent sales tax and the enactment of a new plan of educational equalization which finances practically half the schools from state-administered taxes. Some cities have been hard pressed to find funds for operation of municipal services. Cleveland, in February, 1936, voted an extra levy of 7 mills to carry on ordinary municipal operations.

In Washington the loss of revenue has been made up in excise taxes, a 2 per cent retail sales tax, and occupational taxes. Counties have been hardest hit by loss of support for welfare work. Cities have enacted business license ordinances and special utility licenses, but still many of them are going into debt. Initiative measures to eliminate the sales and occupation tax, and to reduce the state gasoline tax to 3 cents are now being promoted, as is a measure to raise the tax limit.

West Virginia cities, under an over-all tax limit law since 1932, can neither pay their debts nor support their services. Several cities have attempted to bring in substitute revenue by municipal sales taxes.

The authorities contributing to the pamphlet discussion do not deny that the revenue system should be revised, but they are generally of the opinion that the governmental economies desired, and the shifting of the tax burden from real estate, must be achieved by other, less disruptive measures. Advocates of tax limitation, they point out, refuse to recognize the problem of operating government when real estate tax revenue has been reduced and no substitute has yet been found to take its place; and they fail to realize that in the "shift" the tax burden may be put on the shoulders of people just as unable to pay as those who own real estate.

Increase in Airports and Landing Fields

THERE were 2,369 airports and landing fields in the United States on January 1, 1936, according to the Bureau of Air Commerce, Department of Commerce. Of these, 698 were partially or fully lighted for night use. The total included 739 municipal and 494 commercial airports, 291 Department of Commerce intermediate landing fields, 631 auxiliary fields, 63 Army airdromes, 26 naval air stations, and 125 miscellaneous government, private and state airports and landing fields.

On January 1, 1935, there were 2,297 airports and landing fields. Six states had more than 100 airports and landing fields each on January 1, 1936: California, 192; Texas, 134; Michigan, 117; Pennsylvania, 117; Florida, 107; and Ohio, 103.

The municipal airports by states are: Alabama, 6; Alaska, 1; Arizona, 11; Arkansas, 16; California, 51; Colorado, 12; Connecticut, 7; Delaware, 1; District of Columbia, 0; Florida, 42; Georgia, 19; Idaho, 21; Illinois, 15; Indiana, 13; Iowa, 16; Kansas, 23; Kentucky, 8; Louisiana, 9; Maine, 4; Maryland, 2; Massachusetts, 5; Michigan, 46; Minnesota, 10; Mississippi, 12; Missouri, 11; Montana, 27; Nebraska, 17; Nevada, 3; New Hampshire, 5; New Jersey, 4; New Mexico, 6; New York, 27; North Carolina, 12; North Dakota, 20; Ohio, 28; Oklahoma, 23; Oregon, 13; Pennsylvania, 12; Rhode Island 0; South Carolina, 10; South Dakota, 17; Tennessee, 12; Texas, 56; Utah, 5; Vermont, 4; Virginia, 12; Washington, 21; West Virginia, 8; Wisconsin, 22; Wyoming, 14.

Recent City Manager Appointments

FRANK C. HANRAHAN, former city manager of Portsmouth, Va., and more recently with WPA in Washington, was appointed County Manager of Arlington County, Va., effective June 1. He succeeds Roy S. Braden, who resigned to become Manager of the Greenbelt Resettlement Project at Berwyn Heights, Del.

C. W. Meadows, a local engineer, has been named to succeed E. E. Lowrie as City Manager of San Angelo, Texas.

S. P. Mann, a local resident, has been appointed City Manager of Muskogee, Okla., to succeed T. P. Clonts, who has returned to private engineering practice.

J. Bryan Miller, who has served as City Manager of Leonard, Electra, Bryan, Lubbock, and Jacksonville, Texas, became City Manager of Wichita Falls, Texas, on May 15.

Z. Zenn Rogers, at one time Manager of Duncan, Okla., became City Manager of Mangum, Okla., on May 11. This appointment fills the vacancy created by the recent resignation of H. T. Lawrence to enter private engineering.

Virgil R. Short was appointed City Manager of Ardmore, Okla., to succeed Clint H. Dove.

On May 1, Evan S. Stallcup succeeded Fred Wilson as City Manager of Phoenix, Ariz.

CLARENCE E. RIDLEY,
Director, International City Managers' Association.

The Municipal Bond Market

Recent sales of new issues from the May numbers of *The Bond Buyer:*

Amount	Borrower and Purpose	Rate (%)	Term (Years)	Basis (%)
$250,000	Worcester, Mass., Flood Damage	1.25	1-5 Ser.	1.05
300,000	Kansas City, Kans., Improvements	2.25	5.25 Avg.	1.90
125,000	Barnstable, Mass., Sewer	2	10.16 Avg.	1.996
240,000	Orange Co., N. Y., Welfare Home	2.10	11.5 Avg.	2.06
170,000	Greenville Co., S. C., Road	2.25	3.66 Avg.	2.13
11,510,910	Cook Co., Ill., Refunding	4	8.66-14.66 Avg.	3.51
120,000	Amarillo, Texas, Water Revenue	4	13.85 Avg.	3.72

ANOTHER Park-O-Meter CITY !!!

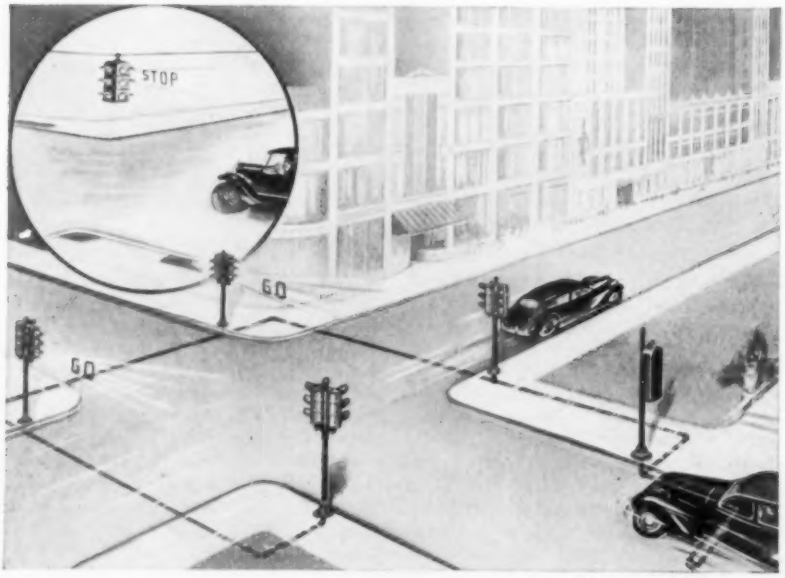
Fort Worth, Texas, is now installing 650 *original* Carl Magee meters

FORT WORTH, Texas, will soon be one of the many progressive cities which are successfully using Park-O-Meters. 650 original Carl Magee meters are now being installed in this southwestern city, and soon will be effectively solving its parking problem. In Fort Worth, parking will be controlled . . business improved city revenue increased and safety promoted. All in all, a serious problem will be solved happily. What Park-O-Meters are doing for other cities, they can do for yours. Investigate this practical plan now. Keep your city in step with the times. Write, wire or call us for complete details.

★ P. S.: SINCE THIS ADVERTISEMENT WAS PREPARED KANSAS CITY HAS ORDERED 3,000 METERS!

DUAL PARKING METER CO.

Commerce Exchange Bldg. *Carl C. Magee, President* Oklahoma City, Okla.



SAFETY— WITH NO DELAYS

Without sacrificing any safety features, the TOKHEIM Traffic-Actuated Signal System controls traffic efficiently and eliminates the irritating and unnecessary delays which accompany the pre-timed systems.

HOW IT OPERATES:

A car approaching the signal passes over a magnetic detector installed under the pavement, and sends an impulse to the controller which gives the motorist the green light. TOKHEIM construction makes conflicting signals impossible.

Send for Our Bulletin Giving More Complete Information About Tokheim Traffic-Actuated Signal Systems.

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Reflectorized Signs on Illinois Highways

By H. H. HARRISON

Traffic Engineer, Division of Highways, Springfield, Ill.

THE need for a higher degree of visibility of warning signs for motor traffic operating in darkness caused the Illinois Division of Highways to adopt a program of sign reflectorization in 1932 which provided for the protection of only the most hazardous points on its 12,000-mile primary system. The public reaction to this has been so favorable as to constitute a demand for the expansion of this type of protection to cover all points of inherent hazard on the system.

Reflectorization of signs has been a matter of constant study during this three-year period in order to secure the most effective design and to make certain that daylight legibility is not reduced in the process. Reflector buttons have served exclusively as the means of obtaining the required illumination. Since the reflectorization of words and symbols is accomplished by combinations of individual reflecting elements of varying sizes, it has required considerable experimentation and revision of design to obtain the proper button sizes and spacings for greatest effectiveness. These studies have resulted in the present series of standards now in use.

The original plan contemplated giving this treatment only to signs in the Slow, Caution, and Warning series. Expansion of this program to include signs of the Information, Regulatory, and Direction series has also been decided upon.

To date, the entire system of some 4,000 miles of U. S. numbered highways and approximately 4,000 miles of the state numbered system have been given this protection. The program has required the reflectorization of approximately 25,000 signs. The signs treated include 4,000 Stop signs, 3,100 Railroad-Crossing Advance signs, 9,300 Slow and Caution signs, 5,000 markers and directional signs, and signs of special designs. Reflectorization of these Illinois signs has cost $75,000 more than the cost of plain signs. On account of the favorable public reaction, this program will soon be expanded to include the entire primary system and possibly many points of potential hazard on the secondary system.

Up to the present time, button-type reflectorization has been the most economical and effective means of illuminating signs. However, studies are being made of other types which have recently been developed. Numerous concerns have become interested in this field, and some of the reflecting elements produced for experimental use warrant careful investigation.

In Illinois, the symbols or messages on the signs are reflectorized rather than the shape, on account of the belief that a precise warning of the exact nature of the hazard is as necessary at night as in daylight. Any increases in the costs of such reflectorization over that for illumination of shapes seems more than justified by the additional protection given.

In order to obtain the most effective placement of reflectorized signs, trial runs at high speeds are made at night. Protection is more necessary for the motorist operating at high speeds than for traffic in the lower speed range. Consequently, these tests have often resulted in the moving of advance warning signs to points farther from the exact locations of the hazards.

SHOWING POSITIONS OF ILLINOIS HIGHWAY REFLECTORIZED SIGNS WITHIN MUNICIPALITIES AND A SUGGESTION OF HOW THEY WARN AT NIGHT

HIGHWAY OFFICIALS! THREE WAYS TO BETTER ROADS AND STREETS

BETTER roads are now within the means of every community, every county and every state. Through the use of calcium chloride any dirt or gravel road can be made smooth, dustless and firm. There are three phases of improvement, each requiring a relatively small outlay of money, yet each producing results worth many times its cost.

1 SURFACE DUST TREATMENT, the first step in road improvement: consists of spreading calcium chloride on the road to prevent dust and loss of road materials. Two or three light applications of calcium chloride during the season are usually sufficient to maintain the road in perfectly dustless condition. Even the smallest road budget can afford this method of eliminating the waste, danger, discomfort and contamination caused by dust.

Method 1

Calcium Chloride being applied uniformly on road for dust-proofing.

Method 2

Distributing clay for bonding loosened aggregate or float material. (Has proven highly successful in Michigan maintenance practice)

2 GRAVEL-CLAY TOP-DRESSING, ordinarily a maintenance function in the case of gravel surfaces: consists of adding just sufficient clay to the loose surface material to bind it. The effect is a "skin treatment" which, through the addition of calcium chloride produces a remarkably smooth closed surface, practically eliminating blading except after rains. The operation is reversed by adding aggregate (chiefly sand) when the surface has excessive cohesive material (clay).

3 STABILIZATION, the comparatively new science of using familiar soil materials to build pavement-like road surfaces: Through years of research and tests, soils engineers have established definite formulas whereby soils having characteristic properties—such as cohesion and friction—can be combined in correct proportions to form a stable soil mass. Calcium chloride is added to provide the moisture bond. The resulting surface is smooth, dustless and—amazing as it seems—so hard that it is difficult to dig into even with a pick-axe. A calcium-chloride-stabilized road is truly an all-weather road and, with extremely economical maintenance, can be kept in perfect condition the year-round.

Method 3

A smooth, dustless all-weather road in DeKalb County, Illinois, accomplished by calcium-chloride-stabilization as described.

WRITE FOR LATEST BULLETINS

No. 18—Maintenance of Stabilized Roads, No. 20—Specifications for Stabilized Roads, No. 21—Computing Quantities of Materials for Stabilized Roads, No. 22—Outline of Stabilization, No. 23—Importance of Crown, No. 24—Plant Mixing Calcium-Chloride Stabilized Soils.

The various phases of soil stabilization are thoroughly covered in these bulletins, based on latest findings of research engineers. Additional technical literature is available on all phases of low-cost road improvement with calcium chloride. Write for this information today.

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CALCIUM CHLORIDE
FOR ROAD IMPROVEMENT

Motorcycles Check Up Parking

TO the known moral effect of the motorcycle officer has been added his special efficiency in checking up on parking violations.

Portsmouth, Ohio, is equipping all its motorcycles with radio receivers. At Houston, Texas, one of the first steps in a drive for safe streets was a request to increase the motorcycle squad from 26 men to 40. Said Mayor Oscar Holcombe: "Motorcycle men are the best curb on reckless driving. Even 40 motorcycles will not be enough, but finances will not permit having more."

"The Tulsa Police Department," writes Chief Charles F. Carr, "has used very successfully in traffic-patrol duty, checking over-time parkers and moving double-parkers in the central business section of this city, two Harley-Davidson Servi-Cars purchased last year, and we are now considering the purchase of two more of these machines. The speed at which the officer operates this type of machine with safety and ease in traffic patrol enables us to cover a much greater territory with reduced personnel and expense."

The parking problem has reached dimensions in many cities where a solution must be found. Some cities in the South and Southwest have installed parking meters with general satisfaction. But even there, police supervision is required. Dallas, for example, combines the parking meter with the three-wheel Servi-Car. An officer cruises up and down the metered streets at 10 to 15 miles an hour watching for the disappearance of the green flag, which is the indication of overparking. Where there are no meters, the cruising officer marks the car with a piece of chalk attached to a long stick. He covers as much territory as six to eight foot patrolmen, checking also double parking and hidden license plates and, equipped with radio, is always available to headquarters. According to Chief George Marland of Denver, these three-wheeled motorcycle men turn in 300 violations per day. Wichita has three of these motorcycles, which, says Chief O. W. Wilson, "perform an amount of car-marking service equivalent to that which would have been performed by 24 men under the old system of chalking cars on foot."

Joplin, Mo., does not use motorcycles to mark parked cars, owing "to shortage of equipment, but," continues Chief Harry J. Mead, "nothing is more useful in this phase of the work." Traffic accidents were reduced 54 per cent last year, and motorcycles were largely responsible for the better record. Says Chief Mead: "The most important arm of the police department in controlling traffic is, of course, the motorcycle officer. There really is nothing that will lift the foot from an extended gas pedal as quickly as the appearance of a motorcycle patrolman. He is not out on the streets for the sole purpose of making arrests, but is there to remind the public of traffic laws and safety."

TULSA CHECKS PARKING WITH THESE SERVI-CARS, AND MAY BUY TWO MORE

South Bend to Modernize System

OFFICIALS of South Bend, Ind., says the Public Administration Clearing House, are planning with the aid of the newly formed Civic Safety Council to modernize completely the traffic system and equipment. The City Council has approved an appropriation to be used in conducting a traffic survey by WPA workers.

Additional improvements contemplated in the city's traffic situation include the laning of streets, revision of timing of traffic lights, and standardization of the method of mounting and color system; a parking survey, and the adoption of a model municipal traffic ordinance.

Signals after Midnight

I SHOULD like to add a further thought to the article on page 97 of THE AMERICAN CITY for April relative to the Chicago experience of 24-hour-a-day traffic signal operation in relation to the hold-up hazard.

Following a series of stop-and-go light hold-ups here two years ago, demands were made for eliminating light operation after midnight, particularly in outlying sections. A happy solution was worked out which has effectively solved the hold-up problem without destroying the usefulness of the traffic lights; and in some respects the solution has resulted in valuable incidental advantages.

At midnight, all traffic lights (except about 5 per cent, or those with old-style timers that will not accommodate the change) go into flashing operation. On the main street, the signals flash yellow, an accepted cautionary warning. On the side streets, the signals flash red, a signal which under Pennsylvania law requires a full stop, similar to a "stop street" sign. Generally speaking, a flashing red light is indicative of great danger. The signals automatically resume stop-and-go operation at 7 A.M.

Our experience with the flashing lights has been as follows:

1. Hold-ups attributed to delay at traffic lights have been prevented.

2. Adequate protection is given motorists. As a matter of fact, the accident experience under flashing operation has been slightly better than under stop-and-go operation.

3. Running past lights, a common violation at times of little traffic, has been prevented.

4. A current saving of approximately $1,000 a year has resulted.

DONALD M. MCNEIL,
Acting Traffic Engineer, Bureau of Traffic Planning, Pittsburgh, Pa.

To Renew School Interest in Safety

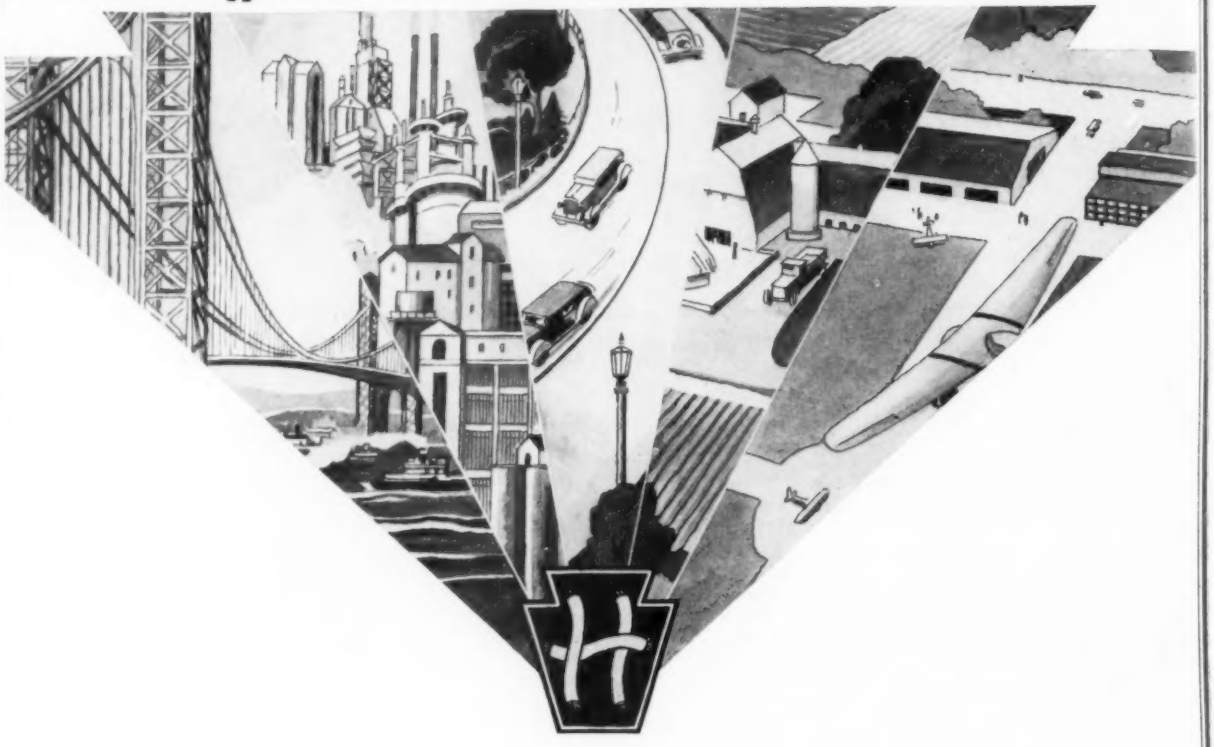
A STUDY of highway safety problems in 100,000 communities will be made throughout the nation as a result of the eleventh national safety campaign, announced by the Highway Education Board. Remedial action will be sought.

Eleven national organizations concerned with highway safety will collaborate in the campaign, and those who make the study will represent the group that has the best record in accident prevention in the United States today. Thomas H. MacDonald, Chief of the U. S. Bureau of Public Roads, is Chairman of the Board.

This group, according to the Board, is the elementary school children of the nation, whose safety record during the period of the earlier campaigns is little less than phenomenal when compared with that of their elders. During a ten-year period, while the adult fatality rate was increasing more than 200 per cent, the Board claims, the child rate remained stationary in the face of advancing car registration, car miles and growing population. When the activity among school children was suspended four or five years ago, the fatality rate showed a 17 per cent increase in one year.

To interest the schools again in safety education, the Board announces a renewal of the safety essay and safety lesson contests open to elementary school pupils and teachers.

Underground without Conduit



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Needed: A Coordinated Housing and Planning Policy

A Warning from England

"IT is not enough to provide a very large number of dwellings, even if it be assumed that they are sufficiently low-rented and satisfactorily designed and managed. It is at least equally important that these dwellings should be built in the right places and in the right relationship to transport facilities, to places of employment and recreation, and to all the other elements which compose the physical pattern of the country's development. Unless the provision of houses is closely interlocked with an efficient system of town and country planning, the national housing campaign may, by its very urgency, create as many problems as it solves."

This note of warning is sounded in a new report of a voluntarily constituted National Housing Committee—the so-called Amulree Committee—published in the *Journal of the Royal Institute of British Architects* for March 21, 1936. Though addressed to the Government and the general public of Great Britain, the document merits prompt and careful consideration on this side of the Atlantic, to the end that America may avoid some of the serious results of failure to develop an effectively coordinated housing and planning policy. Here are some significant excerpts from this report:

"We submit that the absence of effective planning in a large part of the housing activity of recent years has had the most serious consequences. . . . The vast extension of ribbon and sporadic development, which has so seriously impaired not only the safety and efficiency of the road system but also the beauty and agricultural usefulness of the countryside, though perhaps the most obvious, is by no means the only evil. Examples of fundamental errors both of distribution and of interrelation in the development of housing (municipal as well as private enterprise), of industries, of road and rail transport, and of public services, may be found in all parts of the country. . . .

"We are fully alive to the dangers inherent in any system of public control over building development and land utilization. The present system of tentative and patchwork planning may well prove worse than no planning at all. The most careful and cautious application is obviously necessary for any scheme directly affecting the nation's economic structure and which interferes in the distribution and location of industrial enterprises and their dependent populations. But, for good or ill, the country is rapidly passing under the control of the planning schemes of local authorities. Moreover, official action, directly or indirectly, is already constantly interfering with the distribution of industry and population. For instance, the application of a Government subsidy to a particular industry, such as sugar beet, may secure a particular population in its existing position. The selection of a new site for an R. A. F. aerodrome or an aircraft factory may create a new center of population. The prosperity of one manufacturing area may be increased and of another diminished by the negotiation of a new trade agreement with a Dominion or a foreign country. Less immediate but on a far wider scale is the interference involved in the vast programmes of subsidized municipal house building under the 1930 and 1935 Housing Acts. Indeed, the manner in which housing subsidies are distributed by the controlling authorities must have a far-reaching, and might have a decisive, influence on the future pattern of the country's population. Thus public interference and control are inevitable. The only power that can be relied on to prevent their excessive use is the democratic power of the nation as a whole—a power which is likely, in the long run, to be effective for this purpose. The real danger is not so much that use may be excessive as that it may be piecemeal, depending on independent and uncoordinated decisions, made by the various central departments and local and other authorities without any general scheme or common purpose."

In its editorial comment on the report, the *Journal of the Royal Institute of British Architects* says:

"The central control plan as visualized by the Committee is one which will make fullest possible use of the regional control exercised by Local Authorities. The value of regional discretion is great; the inheritance of our system of local government is something which most people would agree must be retained, above all in such affairs as these which intimately affect local prosperity. The greatest difficulty in the application of a scheme lies not in enlisting the support of the local authorities, but in overcoming the dead weight of opposition to all suggestions, from whatever source, for the imposition of control which must in one way or another limit the freedom of the individual to do what he likes with his own land or factory or dwelling-house. At present it is nobody's business, and nobody with authority knows what may be the extent of damage until it has already happened. A survey is necessary, then a plan, and finally a policy for its application."

Record of Low-Rent Housing Progress in the United States

ROUGH and stony has been the way of low-rent housing in 1935, but there are undeniable signs of encouragement for the future ,according to the Housing Officials' Yearbook,* just issued by the National Association of Housing Officials.

Quoting Ernest J. Bohn, President of the Association, which is organized to improve standards and practices in low-rent housing activity, causes for disappointment in 1935 included: "the imperfections of hastily drafted legislation, unsatisfactory relations between Federal and state laws and agencies, popular reaction from the debacle of real estate finance and investment of recent years, and the disposition of many persons to look upon official housing undertakings as temporary and emergency activities." On the side of encouragement Mr. Bohn places these facts: more good housing was produced during 1935 than in the preceding two years together (50 projects under way, 47 actually under construction; 7 limited-dividend projects completed and occupied); some weaknesses in existing legislation were corrected: the rôle of local housing agencies, governmental and non-official, is now more clearly recognized; and some lessons have been learned on housing standards, finance, subsidy, and the relation of various types of housing activity to one another. He describes the year for many of the housing agencies as a time of "getting second wind"—an "uncomfortable period, but an inevitable one."

Continuance of the low-rent housing program, Coleman Woodbury, Director of the Association, points out, depends upon the establishment of permanent Federal housing machinery. How many and what kinds of Federal agencies are needed, and what the scope of operation should be, are, he admits, debatable matters. In his opinion, however, not more than two permanent Federal housing agencies are needed—one for large-scale, neighborhood operations, and one for small unit building on individual lots. "Any other likely division," he says, "seems to me to involve the danger of cutting off private investment funds from large-scale projects financed partly by or even subsidized by Government funds. Such a separation . . . would reduce the amount of low-rental housing to be built."

* See page 127 of this issue.

One of Oak Park's attractive concrete alleys

Concrete Alleys

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CONCRETE alleys have overwhelming popular preference.

Consider the case of the famous Chicago suburb —Oak Park. This village has paved 96½% of its alleys. And of this improved mileage, 98½% or more than 48 miles is paved with concrete!

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Per Capita Costs of Local Government

THE extent to which large cities decrease their expenditures for capital outlays in years of depression as compared with such expenditures in prosperous years is indicated by an analysis of governmental cost payments released on May 13 by the Bureau of the Census. This shows that for the 94 cities having a population of over 100,000, only 12.1 per cent of all governmental cost payments was expended for outlays in 1934 as compared with 31.4 per cent in 1926.

These statistics cover the government of the city corporation proper and also independent districts practically coextensive with the cities. They also include a percentage of the financial transactions of the county government for cities having over 300,000 population, in order that data for such cities may be comparable with those of other cities in this class in which the ordinary county functions are performed by the city government.

From the above-mentioned release the following tabulation has been prepared showing, for the year 1934, the per capita governmental costs for operation and maintenance of general departments, operation and maintenance of public service enterprises and interest. In computing the per capita costs, the population estimate by the Bureau of the Census as of July 1, 1933, has been used, no later estimates having been made.

Per Capita Governmental Costs, 1934

GROUP I—CITIES OF 500,000 AND OVER

	General Departments	Public Service Enterprises	Interest
New York, N. Y.	$71.34	$2.76	$14.32
Chicago, Ill.	36.02	1.88	7.72
Philadelphia, Pa.	39.51	1.04	13.53
Detroit, Mich.	43.28	9.23	9.36
Los Angeles, Calif.	54.01	8.42	8.13
Cleveland, Ohio	46.63	4.96	8.78
St. Louis, Mo.	37.49	2.66	4.19
Baltimore, Md.	41.86	1.50	9.75
Boston, Mass.	74.05	3.27	11.69
Pittsburgh, Pa.	49.39	3.04	9.77
San Francisco, Calif.	51.12	6.52	11.60
Milwaukee, Wis.	61.46	1.68	5.74
Buffalo, N. Y.	71.82	2.12	9.56
Average Group I	54.47	3.45	10.91

GROUP II—CITIES OF 300,000 TO 500,000

Washington, D. C.	69.55	1.82	...
Minneapolis, Minn.	50.25	1.76	6.17
New Orleans, La.	25.40	4.39	10.70
Cincinnati, Ohio	52.23	2.70	12.04
Newark, N. J.	60.49	2.62	16.09
Kansas City, Mo.	33.05	2.64	7.78
Seattle, Wash.	39.47	15.83	14.33
Indianapolis, Ind.	33.63	.06	4.25
Rochester, N. Y.	74.55	1.83	10.62
Jersey City, N. J.	63.40	3.37	14.06
Houston, Texas	23.20	2.48	9.05
Louisville, Ky.	32.10	2.05	5.41
Portland, Ore.	35.42	3.19	11.59
Average Group II	46.22	3.40	9.22

GROUP III—CITIES OF 100,000 TO 300,000

	General Departments	Public Service Enterprises	Interest
Columbus, Ohio	$25.45	$3.19	$6.46
Toledo, Ohio	26.19	2.35	6.30
Oakland, Calif.	31.60	5.48	9.80
Denver, Colo.	41.64	2.35	6.52
Atlanta, Ga.	26.30	1.57	2.73
Dallas, Texas	19.55	1.79	6.20
St. Paul, Minn.	26.80	2.06	7.85
Birmingham, Ala.	15.29	.06	4.60
Akron, Ohio	22.47	1.01	9.48
Memphis, Tenn.	18.78	1.57	5.46
Providence, R. I.	44.10	2.65	9.45
San Antonio, Texas	14.21	.97	6.51
Omaha, Nebr.	24.20	9.23	7.48
Syracuse, N. Y.	53.82	1.51	8.75
Dayton, Ohio	23.97	1.12	5.87
Oklahoma City, Okla.	17.71	1.14	5.76
Worcester, Mass.	54.27	1.98	2.92
Richmond, Va.	30.36	5.10	9.19
Youngstown, Ohio	31.32	2.39	3.35
Grand Rapids, Mich.	28.18	2.26	4.58
Fort Worth, Texas	22.45	1.44	7.51
Hartford, Conn.	52.20	2.22	6.51
Flint, Mich.	30.37	1.90	8.15
New Haven, Conn.	45.98	.02	4.46
San Diego, Calif.	27.96	2.69	5.85
Long Beach, Calif.	35.21	8.01	7.14
Nashville, Tenn.	21.67	2.05	4.66
Springfield, Mass.	57.16	1.90	5.27
Tulsa, Okla.	19.95	1.68	8.03
Bridgeport, Conn.	52.88	.12	4.64
Des Moines, Iowa	28.32	2.19	5.79
Scranton, Pa.	31.71	(*)	2.91
Salt Lake City, Utah	27.36	1.75	4.30
Yonkers, N. Y.	66.55	2.19	13.78
Paterson, N. J.	44.31	4.84	7.97
Jacksonville, Fla.	25.74	10.80	5.97

GROUP III—Continued

	General Departments	Public Service Enterprises	Interest
Albany, N. Y.	53.46	4.02	10.80
Norfolk, Va.	29.58	2.03	18.02
Trenton, N. J.	36.51	3.60	8.72
Chattanooga, Tenn.	19.17	.18	6.07
Kansas City, Kans.	17.89	11.92	5.29
Fort Wayne, Ind.	19.99	7.68	2.34
Camden, N. J.	30.53	2.10	10.72
Erie, Pa.	24.50	2.69	5.11
Elizabeth, N. J.	36.48	2.92	8.55
Wichita, Kans.	23.58	.10	3.64
Spokane, Wash.	23.17	1.35	1.87
Fall River, Mass.	33.37	1.57	4.09
Cambridge, Mass.	50.67	2.95	5.58
New Bedford, Mass.	37.07	2.08	4.06
Reading, Pa.	27.27	1.97	4.64
Knoxville, Tenn.	20.51	1.80	11.76
Peoria, Ill.	25.04	.05	1.98
South Bend, Ind.	20.47	2.54	2.59
Tacoma, Wash.	26.29	6.94	7.49
Miami, Fla.	29.31	1.68	20.01
Gary, Ind.	22.99	...	2.58
Canton, Ohio	23.69	1.56	6.35
Wilmington, Del.	27.67	3.94	6.05
Tampa, Fla.	22.31	1.77	8.96
Somerville, Mass.	41.62	1.66	4.39
El Paso, Texas	14.50	1.82	5.03
Evansville, Ind.	20.46	2.87	1.65
Lynn, Mass.	45.07	2.55	4.10
Utica, N. Y.	47.52	...	6.02
Duluth, Minn.	31.01	7.82	5.57
Waterbury, Conn.	46.03	1.27	8.09
Lowell, Mass.	39.54	3.03	3.93
Average Group III	30.86	2.62	6.51
Average the 3 groups	46.48	3.20	9.40

(*) Less than one-half of one cent.

Surpluses: Profit or Loss?

THIS is the open season for cities to make annual reports to taxpayers. Some of the "fortunate" ones are featuring year-end surpluses, which are pointed to as proofs of good management. But a surplus is not always what it seems, comments an editorial in the May issue of *Public Management*, official magazine of the International City Managers' Association. "Granted that a surplus is a term to conjure with in these days of deficits and more and bigger deficits," says the editorial, "still one cannot help wondering what large dividends this surplus might have yielded if wisely invested in a little more community service."

If the discriminating reader of the public report turns from the surplus item to find that the infant mortality rate is 96 per 1,000 births instead of 59.9 (the 1934 average for the United States) he ought to consider whether the surplus is evidence of economical administration or proof of a lack of appreciation of the community's social needs. The same is true if the auto accident rate is higher than it is in other cities with comparable conditions; or if the fire losses and crime rate are unduly high.

In other words, the editorial referred to concludes:

"The *real* cost of city government is a combination of the excess or unnecessary cost resulting from bad government plus the cost that results from a lack of government participation in particular activities. On the side of bad government these excess costs may include such items as having inexperienced and incompetent administrative officials, lax contract procedure, loose budgeting practices, and poor departmental organization. But equally, on the side of inadequate government, excess costs may be concealed in higher rates for fire and burglary insurance, increased expenditures for crime detection, and the incalculable losses from infant and adult mortality."

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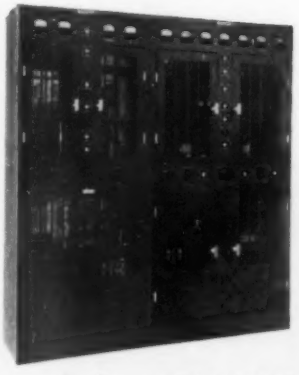

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Demolition of Unsafe Housing

INADEQUATE legal power, as well as political interference, too often stands in the way of the demolition of unsafe housing, according to the *Housing Officials' Yearbook*, issued last month by the National Association of Housing Officials.

"Although scarcely a single national or local plan for housing activity is proposed nowadays which does not include some reference to demolition as a necessary or advisable activity," says Edmond H. Hoben, Assistant Director of the National Association of Housing Officials, "many local governments feel that they must first have ready a comprehensive city plan and rebuilding program. This is not necessary. A great good may be accomplished merely by removal of the unsafe buildings and leveling of the sites."

The absence of proper legal machinery, according to Mr. Hoben, too often blocks the demolition of unfit buildings. In some cities the officers who are charged with carrying out a demolition program are personally liable for damages resulting from their official activities. This situation, Mr. Hoben points out, should be corrected. Often, too, responsibility for demolition is so widely distributed among various city departments, such as police, fire, or health, that no one of them is willing or able to carry on a broad and effective campaign under its limited powers.

To the objection that an impending housing shortage makes it difficult to find quarters for persons displaced by demolition activity, Mr. Hoben answers that "if any consequential amount of demolition is to be accomplished, much attention cannot be given to the objections engendered by either a depression-bred destitution or by housing shortage. If such objections were allowed to control policy, there would be effective demolition only during short periods of normalcy on the way up from or down to an economic slough." In some large cities political corruption has actually blocked the efforts of interested groups to inaugurate more effective programs, he comments. Unless the pressure from civic groups is too great, he adds, politicians and officials have been interested more in protecting than in eliminating unfit structures, because their continued existence guarantees a constant source of revenue from owners paying "protection."

In Mr. Hoben's opinion, Milwaukee has carried on a successful demolition program, "unusual in that its inauguration or continuity cannot be traced to any marked crusade on the part of citizens' groups." During the past six years, 1,800 housing units have been eliminated and 4,126 units have been constructed. Efficient inspection work of the regular staff enables the Building Inspector's deputy with one assistant to make out all papers and serve all notices necessary to compel repair or demolition of buildings reported unfit. In 1934 the Building Inspector's office, with CWA help, surveyed all frame structures in 33 per cent of the area districts, and by the end of 1935, 95 per cent of the buildings reported unsafe had been demolished.

Central Fiscal Officer Advocated for Villages and Small Cities

CONSOLIDATING the usual dozen or so governmental offices and putting them in the hands of a single officer is suggested as an economical and efficient plan for small cities and villages, in the current issue of *Municipal Finance*, quarterly journal of the Municipal Finance Officers' Association. The plan is described by C. R. Nimmons, who is the "consolidated officer" of Johnson City, N. Y., town of 11,000. Mr. Nimmons has held this position for several years, since Johnson City residents demanded simplification of its government through consolidation of offices, with economy a secondary objective.

At one time Johnson City employed from nine to twelve different men to transact the duties of village clerk, treasurer, tax collector, assessor, building inspector, registrar of vital statistics and water rent collector. The clerk and the tax collector were employed on a full-time basis, while the remainder of the posts were distributed among village residents "of the correct political affiliation." These employees cost the village about $12,000 a year.

Mr. Nimmons, with the title of "fiscal officer," performs all the above duties, at a considerable saving in salary to the city. He emphasizes, however, that he is "not separately a treasurer, a tax collector, a clerk," but that he is an "administrator of interrelated municipal affairs." This "fingertip control," he says, "minimizes duplication of effort and contributes to greater efficiency and economy. Collection of water rents and special assessments, for example, is carried out by identical methods in so far as possible under restrictive state laws. . . . Index-systems—the same for building inspections as for vital statistics—permit easy reference. . . . A plan which has proved efficient in one department is adopted for use in another. . . . The conduct of the assessor's and treasurer's posts by a single person has permitted establishment of a system of uniform assessment and has resulted in the elimination of complaints on alleged unfair assessments.

Mr. Nimmons does not recommend the consolidated plan for cities over 20,000. But for small cities and villages, "where elective officials have neither the time nor the inclination to make their municipal jobs full-time ones," he believes it to be "ideally suited."

Translating Local Government Costs

COUNTY Manager Roy S. Braden, of Arlington County, Va., a community of 35,000, believes in translating the cost of government into terms the taxpayers can understand. In his proposed budget for 1936-1937, according to the *City Manager's News Letter*, is this statement of per capita annual costs:

For the County Board, Manager, Auditor and Purchasing Department, $0.79, or the price of 5 gallons of gasoline.

For tax assessing and collecting, $0.97, which is the cost of 2 pounds of Virginia ham.

For the courts, $0.42, or a pound of steak.

For police, $1.41, or a 4-pound chuck roast.

For fire protection, $1.00, or a pair of silk stockings.

For welfare, $0.12—one tube of shaving cream.

For health service, $0.46—a quart of ice cream.

For engineering service, $0.60—a Coca Cola a month.

For sewer operation, $1.15—the price of a straw hat.

For garbage and refuse collection, $0.88—a half-dozen roses.

For upkeep of buildings and grounds, $0.42—three quarts of milk.

For street lighting, $0.80—an inexpensive necktie.

For roads and streets, $4.57—less than one shoe shine a week.

For debt service, $2.07—two Sunday dinners "out."

For schools, $12.5—one movie a week.

Moreover, Arlington County citizens are not taxed directly for all these services. The taxes on real and personal property, amounting to $768,150, represent an annual per capita payment of $21.95, or $1.83 a month—"quite a lot *less* than the cost of one loaf of bread per day," says Mr. Braden.

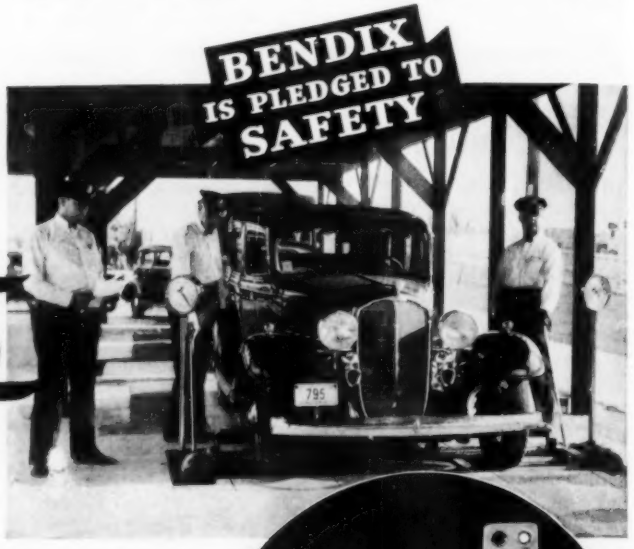
Training Police "On the Force"

INCREASED attention to the training of police by special courses after they have entered the service is evident from the tally of new "schools" arranged since the first of the year, according to the April issue of the *Police Chiefs' News Letter*, bulletin of the International Association of Chiefs of Police.

As the first experiment in its proposed program to hold a series of regional fingerprinting schools, the Federal Bureau of Investigation recently taught police officers of the Dallas, Texas, region how to make identifications. Over 50 police

MIAMI, CINCINNATI, BILLINGS, KNOXVILLE JOIN THE MARCH OF THE CITIES FOR

Safer Streets



SAFER streets start with safer cars! That's certain! City after city turns to municipal vehicle inspection as a vital move in the nation-wide drive to cut traffic accidents, and city after city turns to time-proved, scientifically accurate Bendix equipment.

Bendix makes more brakes and more power braking equipment, than any other concern in the world. Bendix *knows* brakes. Quite naturally, Bendix Civic Safety Clinic Equipment for testing brakes, as well as steering, headlights and other safety factors, is designed to do the work precisely—properly—swiftly. That's why Bendix Civic Safety Clinic Equipment is preferred for municipal vehicle inspection—just as Bendix *corrective* equipment is the favorite among progressive chassis service shops.

Note the clean-cut, quick-action layout in the Miami Safety Line illustrated. Bendix equipment is employed by the automobile factories for final testing of new cars. It has to be fast and thorough!

Write for full details—prices, terms and proved municipal safety line operating plan. Use the coupon at right.

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401 Bendix Drive, Dept. A-6, South Bend, Ind.
(Subsidiary of Bendix Aviation Corporation)

MIAMI, FLORIDA

Above: New Municipal Safety Test Line installed in the interest of SAFER STREETS by this progressive safety-conscious metropolis.

●

Right: Tests wheel alignment, caster, camber, toe-in, entire steering geometry, precisely, quickly, easily.

Above: Tests each brake separately—by full wheel revolution under electric power . . . shows total stopping ability . . . shows up "out-of-round" drums. TESTS TRACTOR AND TRAILER TRAINS with utmost accuracy.

New BENDIX *Civic Safety Clinic*

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Send me at once full details about Civic Safety Clinic Equipment, prices, operating plan, etc.

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City.....*State*.....

Business or Profession.....

City Official (title) ☐.....Dealer ☐

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officers, sheriffs, constables and other peace officers attended the five-day course.

Three new states are installing police training schools. The League of South Dakota Municipalities has announced three-day training schools in each of three different cities during April. The Minnesota League of Municipalities will hold a training course for police in May. A school is being planned by the Illinois Municipal League, and Georgia is considering holding one.

An unusual example of city-university cooperation in the training of police is found in Wichita Municipal University, Wichita, Kans. The University has established a two-year course in police science, and 14 men now enrolled work part time for the Wichita Police Department at salaries of $50 a month while they learn.

The Massachusetts Association of Chiefs of Police will meet this month to consider cooperation with the Bureau for Street Traffic Research at Harvard University in the operation of a New England Traffic Officers' training school.

The course for traffic policemen at Northwestern University, Evanston, Ill., will play a part in the new urban traffic safety training program of the International Association of Chiefs of Police which has been made possible by a grant of funds from the automotive industry. This school, during its three years of existence, has been attended by approximately 125 police officers from all parts of the country.

Neglect of Maintenance Is Not Economy

CUTTING the budget on expenditures is not the same as economy for the municipal public works department, according to Frank W. Herring, Executive Director of the American Society of Municipal Engineers and the International Association of Public Works Officials. Mr. Herring explains why, in the current issue of the *Public Works Engineers' News Letter*, published jointly by the two organizations.

While economy in the public works department, which spends so large a share of the city's purse, is thought to be served by limiting expenditures to a figure far less than the amount estimated as necessary for adequate care of the properties, he says, "True economy must take into consideration that expenditures and costs are not the same thing, except in the very long run."

"One of the larger elements entering into the cost of public works is the physical deterioration of municipal facilities —streets, sidewalks, sewers, sewage-treatment plants, water systems, public buildings, and so on," he points out. "Frost and rain take their toll entirely independent of the level of public works expenditure. Wear and tear through use proceed, regardless of the best intentions of the budget makers. In fact, the annual cost of deterioration is quite beyond the control of any public body, for it is caused by forces not taking orders from the city hall."

To maintain at its full value the integrity of a property—which is the real meaning of "maintenance"—requires that the care provided keep pace with the inescapable losses through deterioration, Mr. Herring points out. "In other words, expenditures must keep pace with costs. . . . When regular care is allowed to fall short of the needs of the situation, the difference represents the value of city property that has been abandoned. And . . . to reclaim properties that have been neglected for a period of years is a painful and expensive operation."

Changes in Municipal Government

SEVEN of the 11 cities in this country which in 1935 changed their forms of government became council-manager cities, and now for the first time the number of cities operating under a city manager exceeds the number whose affairs are directed by a commission. This change is only one of the numerous ones occurring in the governmental habits of cities as they are recorded in the 1936 Municipal Year Book, published April 18 by the International City Managers' Association. Information on new trends in finance, police, housing, planning, and other functions is given on the 960 cities of the United States over 10,000 in population.

Governmental data on these cities show that at present more than one-half of them operate under the mayor-council plan. The council-manager cities, operated through a city manager, number 462, an increase of 15 during 1935. The town meeting continues to function as the form of government in 36 New England cities and in one city in New Jersey. Cities under the mayor-council plan most often have seven persons in the legislative chairs. Under the commission and the council-manager forms of government, the number of members is most frequently five.

How much interest did the people of these 960 cities take in electing their local lawmakers?

An analysis of the voting in municipal elections in 760 of the cities shows that only a little more than two-fifths of the population over 21 participated in the last council election. The remainder refrained because of lack of citizenship, lack of interest, sickness, or some other reason, perhaps rain. This number is 14 per cent under the approximate percentage of the total population over 21 in the United States which voted in the presidential election of 1932. The proportion of registered voters to the total population eligible to vote—62 per cent—however, is slightly higher than the figure reported last year. This, according to the Year Book, "may indicate an increased electoral interest in municipal affairs, or it may mean only that more persons have reached the age of 21 since the 1930 census than the number of persons over that age who have died."

Cincinnati Seeks Lower Mortality Rate

FOR a number of years Cincinnati had a mortality rate 25 per cent higher than that of the average American municipality. According to *Public Management*, magazine of the International City Managers' Association, study of the reasons for this unfavorable situation was recently undertaken by the Public Health Federation, which represents all public and private health organizations in the country. Comparison with twelve other cities of the country of similar size, with comparable Negro and white population, showed first of all that Cincinnati's white death rate was 1½ per cent higher than the average—not a significant difference; but the Negro rate was 12½ per cent higher than average.

Vital statistics of every one of the city's 107 census tracts were also examined by individual death certificates. By a method of economic rating on the basis of median rents, it was found that although for many diseases the death rates differed but little in the four economic areas set up, in the tolls of certain of the diseases there was a great contrast between the families of the lowest income groups and the rest.

The white baby born in congested tenement areas (around Cincinnati's downtown Basin) has one-half the chance of the more fortunate babies of the suburbs to complete his first year. Up to 15 he runs 2½ times the risk of succumbing to the contagions of childhood. At almost any age he is more than three times as likely to die of pneumonia.

Suicides among poor white people were shown by these studies to be twice as frequent as among those more fortunately situated; and murder six times as great. From all causes combined, the rate of death is 50 per cent higher in the congested areas. Similar contrasts were found for the Negro population of different economic status, the single exception being the suicide rate, which among the poorer Negro groups is only one-third of the rate among better-to-do Negroes.

Bleecker Marquette, Secretary of the Public Health Federation, who writes the article, believes that the Cincinnati study has added to the proof of the assumption that disease and high death rates are very closely related to poverty. "Needless to say," he adds, "no one community can do much about [raising] income levels, nor does it seem likely that these levels can be changed rapidly." Reclamation of slum areas is a slow process, also. Therefore, more efficient public health machinery and greater expenditure for preventive work where it is most needed must be utilized.

In Cincinnati, areas where concentration of public health effort is needed were made apparent by the health study. With this knowledge at hand, the Public Health Federation is at present making an investigation of the best way of providing the most effective public health and hospital services for the city.

SUBJECT— BRICK PAVEMENT MAINTENANCE COSTS

PLACE— WILLIAMSPORT, PA.

PERIOD— WINTER 1935 - 36

MILEAGE— 27 MILES, TOTAL

MAINTENANCE COSTS— $20.00

PRESENT CONDITION— EXCELLENT

AUTHORITY— MR. LYONS MUSSINA, CITY ENGINEER, WILLIAMSPORT

REMARKS— THE WINTER OF 1935 - 36 WAS ONE OF THE SEVEREST ON RECORD, WITH WIDESPREAD WINTER DAMAGE TO PAVEMENTS.

Williamsport Sun comments editorially April 22: "If the people of Williamsport were to be asked their opinion as to the best paving material for city streets as demonstrated by the severe winter and flood, we believe they would express a preference for brick as a material of proved superiority."

THIS DATA PUBLISHED BY NATIONAL PAVING BRICK ASSOCIATION, NATIONAL PRESS BUILDING, WASHINGTON, D. C.

Less Than One Dollar Per Mile Was The 1935-36 Winter Damage Costs On Brick Pavements At Williamsport, Pa.

Busy Williams Street Brick Paved in 1921
High St., important Williamsport artery
Check your upkeep costs against 27 miles for $20
Heavy duty, Built 1895 Relaid 1921
Park Ave.—Part of Susquehanna Trail

BRICK

PROTECTS AGAINST *Weather* AS WELL AS TRAFFIC

Prepared by
FRANK B. WILLIAMS
Author of "The Law of
City Planning and Zoning"

Zoning and Planning Notes

From Data collected
by the Zoning Committee
of New York
(233 Broadway)

Garage

MICHIGAN.—*Eddy and Louis v. Tierney, Building Inspector, Circuit Court for County of Saginaw.* (Not reported.)

Section VII of the zoning ordinance of Saginaw, Mich., dealing with commercial districts, in paragraph (3) permitted mercantile establishments, and in paragraph (4) permitted public garages if kept 30 feet distant from the street, or 10 feet from the street with the written consent of a certain percentage of neighboring owners.

The Goodyear Company applied for a permit to erect a brick and concrete building. The contemplated improvement of the property, which was a corner lot in the business center, included also a concrete island upon which gasoline pumps would be located. There was no canopy or covering between the building and the gasoline pump island. The proposed location of the building would bring it within the 30 feet, and there was no neighborhood consent; on the contrary, there was a hot controversy between the Goodyear Company and the neighborhood, out of which the litigation arose.

The proceeding was for a declaratory judgment; that is, a judgment by the Court interpreting the ordinance and declaring whether or not the proposed improvement falls within the mercantile establishment paragraph or the public garage paragraph of Section VII.

The ordinance defined a public garage as a "space or structure . . . for the storage, care, repair or refinishing of motor vehicles (etc.)."

The plan of the building and the intention of the Goodyear Company as regards the use of the building and property was for an office, the sale, storage, repair and installation of tires, batteries and other automobile accessories, and the sale and application of oils and gasoline. The intended use did not include storage of automobiles for the sake of storage nor the repair or refinishing of the motor vehicles themselves.

The Court held that the proposed construction and use of the building, of the gasoline pump island, together with the contemplated use of the entire premises taken in their entirety and as a whole, constituted one project—a public garage.

—From American Society of Planning Officials *News Letter.*

Certiorari

NEW YORK.—*Matter of Neddo v. Schrade*, 270 N. Y. 97 (Court of Appeals, March 3, 1936).—One Musa Q. Jackson is the owner of a large dwelling in a district which was by the ordinance of the city of Saratoga Springs zoned as residential. In the course of time the character of this district changed from residential to commercial and she petitioned the Common Council of the city to rezone her property as commercial. The Council granted her petition, amending the ordinance accordingly. Thereupon neighbors owning nearby residential property sought a statutory writ of certiorari, under the zoning enabling act, to review the act of the Common Council.

This Court dismissed that writ. The statutory writ of certiorari applies only to actions by boards of appeal, and no such body has been created under the Saratoga Springs ordinance. Mrs. Jackson's petition was to the Common Council, for an amendment of an ordinance. The passing of that amendment by the Council was a legislative act, which is not reversible, by the courts, in certiorari. For this reason this action is dismissed.

EDITOR'S NOTE.—In some instances the legislative bodies of municipal and semi-municipal governments are given administrative powers, and there may be a review of their decisions in that capacity by certiorari. The Nebraska case of *Coulthard v. Board of Adjustment* reported in these Notes for last month, above, shows such a case. In this case, however, the Council was not acting in an administrative capacity, and certiorari was not applicable.

For a similar case see the New York decision of *Hamlett v. Snedeker*, in these Notes for April, 1936.

Filling Station

NEW YORK.—*People ex rel Rubin v. Bevan*, Supreme Court, Westchester County, reported in *New York Law Journal*, May 7, 1936, page 2349.—One of the provisions of the zoning ordinance in question requires that no gasoline filling station shall be allowed even upon consent of the Board of Appeals, unless the plot to be so used is at least 8,000 square feet in area. Such a provision is not unreasonable. We are all familiar with the danger of access drives to gasoline filling stations, and such a provision is an aid to the movement of traffic to and from such station, and a distinct aid to safety.

Highway—Abutting Land—Easement of Light, Air and Access

NEW YORK.—*Griefer v. County of Sullivan*, 246 Appellate Division 385 (March 13, 1936).—In the contemplated reconstruction of a highway the county of Sullivan condemned a tract of land belonging to the plaintiff Griefer only to find later that a small part of it was not needed for this purpose. It therefore sold this parcel to the defendant Shimer, thereby cutting off a portion of the land of Griefer from access to the highway. This is an action to compel the re-conveyance of this parcel to the county, and the Court so orders.

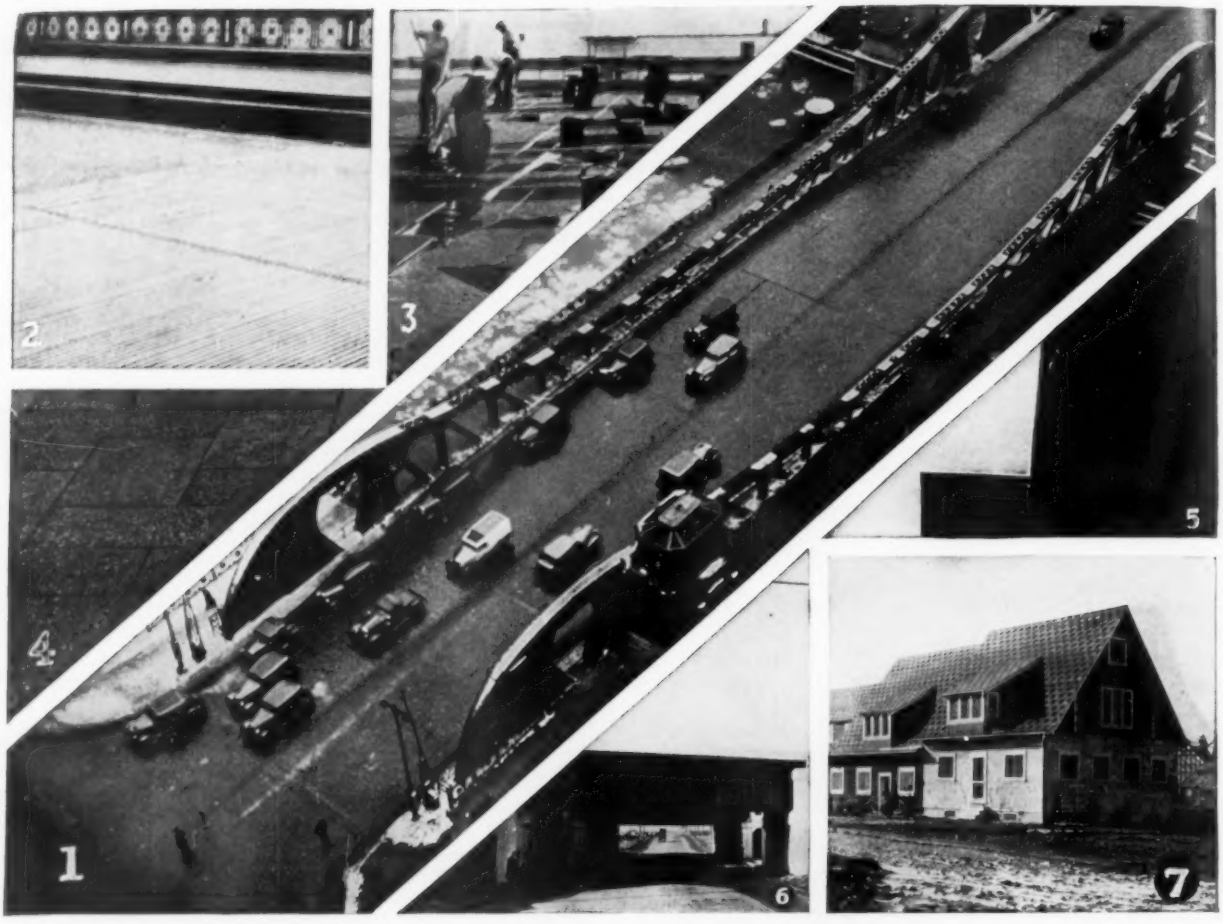
Whether the plaintiff owned the fee of this old highway (subject to the right of the public to use it for highway purposes) or whether the fee was in the county, the plaintiff had a right of light, air and access from and over it in its entirety to every part of her land; and such rights are property rights. When the county acquired the land between the old road and the pavement of the new road, it did so for highway purposes. Except for these lands being necessary as a highway they could not have been so acquired. Upon acquisition they became a part of the right-of-way of the new highway and as such were widened with the usual right of access in the plaintiff as an abutting owner. She had access over this right-of-way to the pavement of the new highway for the entire distance that her lands fronted upon the new highway. Hers were then the rights of an abutting owner along this new highway. The county's later discovery that it had taken from her by condemnation more land than it actually needed for the new highway did not authorize it to sell such land to another, to the complete extinguishment of the plaintiff's property rights under consideration.

The Zoning Round-Table at the Planning Conference at Richmond

At the Conference of the American City Planning Institute, the American Planning and Civic Association, and the American Society of Planning Officials recently held at Richmond, Va., the usual zoning breakfast was held, over which, as usual, Edward M. Bassett presided. About a hundred people attended the breakfast, and the interchange of information during its progress gave an attentive listener a very good idea of the state of zoning in this country at this time.

GASOLINE STATIONS

While fifteen years ago the subject of the adjustment of garages to their environment was of more general interest, today that of gasoline stations is more important, more cases arising with relation to them than with regard to any other zoning matter. These stations are usually excluded, by our zoning ordinances, from business districts, except on resort to the Board of Appeals. It is interesting, therefore, to note that Baltimore is thinking of creating a special district in which all



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ASPHALT PLANKING

More than seven years ago Servicised standard bridge planking was laid on Chicago's LaSalle Street bridge, Figure 1. Today the same material with no replacements or repairs gives promise of providing a perfect wearing surface indefinitely. Figure 2 shows Servicised Sementread non-skid planking for bridges. Specifying asphalt plank for roof decks has become common usage with many architects since the World's Fair, Figure 3, proved its practicability. Figure 4 shows Servicised Rock-Surfaced non-skid planking for bridges. Time proven standard asphalt plank is used wherever a tough but resilient wearing surface is required—see Figure 5. Recently completed 95th Street underpass, Chicago, Figure 6, has Servicised asphalt plank protecting its membrane waterproofing from puncture by railroad ballast. Figure 7 shows standard and Sementread planking for building and power plant construction.

In addition to the above-illustrated, more common uses of Servicised asphalt plank, it is regularly specified for industrial floors and loading platforms, as a protection for corkboard walls of refrigerator rooms, and as filler for steel channel bridge floors. Where wearing quality and lightness in weight is desired use asphalt plank. Servicised will give you service on your requirements of asphalt planking of any type, for any use, anywhere, anytime.

Servicised Premoulded Bituminous Specialties too numerous to mention, can solve many a construction problem better, saving time and money as well. Send our engineering department details of your special requirements or problems. If premoulded bituminous material can be used Servicised can make it.

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the usual business uses will be permitted, and gasoline stations in addition. These districts will probably be small, and located on corners where they will do little or no harm. If successful, these districts should simplify zoning administration, and lessen the resort to Boards of Appeals and the Courts.

OPEN-AIR PARKING

Garage owners resent the competition of open-air parking spaces, and nearby property owners try in every way to prevent or abolish them, but, especially in these days of depression where valuable land is often vacant for long periods of time, they are on the increase everywhere. This is perhaps especially true in New York City, as shown in part by the recent cases on this subject, such as *People on Complaint of Inspector Dean* in our March, 1936, Notes, and *Monument Garage Corporation v. Levy* in our Notes for April, 1935.

RE-ZONING

It was generally recognized by those present that zoning was of great value, and stood in need of improvement. Such improvement is difficult and, at best, slow. For its success, as experience abundantly demonstrates, it must have the support of the property owners, and their gradual education to its advantages. In New York, on the west side of Manhattan, an attempt is now being made in a backward area to require lower density and better living conditions; and for two years those of the landowners who see its advantages to them as well as the general public have been circulating petitions for such a change and gradually educating the public to the need of it. In Queens, along new boulevards of more than usual width, zoning has recently been strengthened for about five miles. In Flushing, where land is to be filled for the World's Fair, the height limit has been, over large areas, lowered from one times to three-fourths.

FREEWAYS

A freeway, as our readers know, is a highway intended for rapid through traffic in which the abutting landowners are deprived of the customary right of access from their land to the highway. This gives the authorities the power to allow access only at such places as seem best to them, and greatly increases the capacity of the highway by lessening congestion and increasing speed. Connecticut, New Jersey, New York, and Massachusetts are all attempting to give their state highway commissions the power to build freeways. Of course it is seldom advisable to change an existing highway into a freeway; for the expense of paying the abutting landowners for the rights of access of which they are deprived is great. The place for freeways is a mile or two back of an overcrowded main thoroughfare, which it will greatly relieve.

The freeway may prove to be a partial solution of one of the most difficult practical zoning problems—that of the regulation of land in main thoroughfares. Landowners on these thoroughfares usually ask to have their land zoned for business; but the enormous distances along such thoroughfares cannot be filled with stores. And the great automobile traffic does not make such land desirable for residence.

The freeway, by taking care of a large amount of through traffic, lessens the number of ordinary traffic thoroughfares and the zoning problems they create. These freeways may be paralleled by local service roads, with planting to mask the freeway with its traffic.

Better Highways Reduce Vehicle Operating Costs

HIGHWAYS pay their way by reducing the operating costs of vehicles using them, and on heavily traveled roads they return substantial profits to the public, says the Bureau of Public Roads after a study of the mileage of vehicle travel in three states in comparison with highway expenditures. Annual payments for highways, the Bureau reports, amount to slightly more than one cent per mile of vehicle travel on all highways in Wisconsin, Michigan and Minnesota, according to figures collected by this Bureau of the U. S. Department of Agriculture. In Wisconsin and Michigan the payment is 1.08 cents per mile, and in Minnesota 1.1 cents per mile.

Analysis of highway costs and travel on the state systems, which include Federal-aid roads, of Wisconsin and Michigan shows that payments amount to .83 cent and .86 cent per mile of travel respectively. The figures for county roads are 1.23 cents in Wisconsin and 1.66 cents in Michigan.

The lower costs for main highways agree with the well-established rule that large volumes of traffic make possible the construction and maintenance of high-type surfaces at a very low cost per mile of travel.

The actual saving in vehicle-operating cost resulting from replacing a dirt road with a smooth, hard surface has been variously estimated and is probably not less than 3 cents a mile. On this basis, says the Bureau, a large mileage of highways is paying tremendous profits to highway users. Actual payments of gasoline taxes and motor-vehicle fees, when distributed in proportion to travel on different roads, show that many highways are earning substantial profits for the public.

Travel on the roads of Minnesota is not so heavy as in the other two states, and payments for highways amount to 1.4 cents per mile of travel on the state system and 1.3 cents per mile on county roads.

Payments per mile of travel on city streets range from 0.5-cent to 1.08 cents, and for township roads from 1.29 cents to 3.1 cents.

These figures are based on travel on all roads of each of the classes and are not restricted to travel on those that have been improved.

Secretary Roper Urges Public Works Planning

"I BELIEVE that business, in cooperation with communities, states and the National Government, should give careful study to the development of a broad, useful public works program which would serve as a reservoir for employment in periods of depression. If such a well-developed program had been available at the beginning of the last depression period, a channel would have existed into which those workers who were thrown out of employment could have been placed without delay.

"Much constructive work could be accomplished in conserving and rebuilding our natural resources in developing parks and waterfronts and making other public improvements which add materially to our national wealth and progress.

"The success of such a program would depend primarily upon planning ahead of time so that when conditions demanded it the program would be put into immediate operation by localities and states whenever any large measure of unemployment threatens business stability. Even under the hurriedly constructed program of the past three years we have found that public works do provide a reservoir of employment and do serve to stimulate private enterprise toward sound recovery.

"I believe that any such public works program to succeed must have the cooperation of business and industry. Therefore business should, through its properly constituted organizations, begin immediate research studies concerning long-term and long-range public works."

—From an address by DANIEL C. ROPER, Secretary of Commerce, before the Chamber of Commerce of the United States, April 28, 1936.

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There's an economical Stanolind Asphalt for every paving requirement, and Standard Oil's representatives are always ready and glad to lend the help of their knowledge and experience in the selection of materials and methods for any particular job. Telephone your local Standard Oil (Indiana) office, or write

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IN LONG-WEARING ROAD MILES . . . ***IN*** DISTRIBUTION OF LABOR . . . ***IN*** TAXPAYER SATISFACTION

The City's Legal Rights and Duties

Conducted by A. L. H. STREET, Attorney at Law

Drainage

Flooding of private property, caused by public improvement, although recurring only occasionally, held to support award of damages based on property's diminished value (Texas Commission of Appeals: *City of Texarkana v. Rhyne*, 86 S. W. 2d, 215).

Judgments

Land acquired by city at tax sale and not in public use held subject to levy under judgment against city (Florida Supreme Court: *City of Sanford v. McClelland*, 163 So. 513).

Liquor Regulations

Ordinance forbidding sale of intoxicating liquors excepting as permitted by state law upheld, full text of ordinance being embodied in opinion (Florida Supreme Court: *Sloan v. Hutchingson*, 163 So. 61).

Borough authorities held subject to mandamus to levy taxes and to borrow funds to permit execution of proper municipal functions (Pennsylvania Court of Common Pleas, Allegheny County: *Commonwealth v. West Homestead*, 27 Pa. Mun. Law Rep. 75).

Referendum Proceedings

Referendum petitioners' right to withdraw signatures held to expire when time to file petition would expire, regardless of date of council action on petition (Texas Court of Civil Appeals: *Texas Power & Light Co. v. Brownwood Public Service Co.*, 87 S. W. 557).

In computing sufficiency of referendum petition names of persons registering after filing of petition, names signed by other persons, and names varying from those registered, held properly excluded (Massachusetts Supreme Judicial Court: *Putnam v. Bessom*, 197 N. E. 147).

Salaries

Deputy assessor held "public official" whose salary could not be reduced during his term of office (Kentucky Court of Appeals: *City of Louisville v. Fisher*, 79 S. W. 2d, 345).

Charter prohibition against reduction of salary during term of office held not to apply to officer holding over after expiration of his term, pending selection of his successor (Michigan Supreme Court: *Bodell v. Battle Creek*, 259 N. W. 658).

Officer's acceptance of invalidly reduced salary held not to bar recovery of excess due (Kansas Supreme Court: *Peterson v. City of Parsons*, 33 Pac. 2d, 715).

Streets

Facilitation of traffic movement on adjacent streets held to justify closing short street in Los Angeles—famous Olvera Street—to vehicular traffic, as against complaining abutting property owner (California Supreme Court: *Simpson v. City of Los Angeles*, 47 Pac. 2d, 474).

City held to have wrongfully removed tree from parking strip along street, but abutter's suit for damages was barred through failure to file claim within required time (Washington Supreme Court: *Shaw v. City of Yakima*, 48 Pac. 2d, 630).

Taxation

Town bondholder held entitled to pay taxes in interest coupons unless town showed that through exhaustion of taxing power, government could not be carried on without payment of taxes in money (Florida Supreme Court: *Hunt v. Dundee Citrus Growers Assn.*, 163 So. 83).

Statute enabling certain large cities to impose a sales tax for unemployment relief upheld (New York Supreme Court, New York County: *Garfield v. New York Telephone Co.*, 278 N. Y. Supp. 752).

Water Departments

Resident of annexed area held not entitled to compel city to extend water service up mountainside, funds for extension being not available (Maryland Court of Appeals: *Schriver v. Mayor and City Council of Cumberland*, 181 Atl. 443).

Decisions on Licenses

Ordinance forbidding barber shop license to one not a resident of county for at least one year held void (United States District Court, District of New Jersey: *Zimmerman v. City of New Brunswick*, 10 Fed. Supp. 401).

Ordinance imposing $50 license tax on doctors and dentists upheld (Arkansas Supreme Court: *City of Helena v. Russworm*, 79 S. W. 2d, 993).

Ordinance requiring applicant for beer license to also hold liquor license held invalid as conflicting with state law (Wisconsin Supreme Court: *State v. Krawczak*, 259 N. W. 607).

Statute authorizing license taxes against "merchants" and grocers held inapplicable to non-resident wholesale coffee company selling on solicited orders (Oklahoma Supreme Court: *Cain's Coffee Co. v. City of Muskogee*, 44 Pac. 2d, 50).

Borough ordinance imposing license tax on house-to-house peddlers of bread, but exempting local dealers, held void (Pennsylvania, Court of Quarter Sessonsfi Montgomery County: *Commonwealth v. McKendry*, 26 Pa. Munic. Law Rep. 58).

Gasoline tax ordinance requiring dealers to keep records of purchases and sales upheld (Louisiana Supreme Court: *City of New Orleans v. Paciera*, 158 So. 1).

Municipal annual license fee of $5 imposed against motor vehicles not operated for hire upheld (Kentucky Court of Appeals: *Daily v. City of Owensboro*, 77 S. W. 2d, 939).

Daily penalties for license ordinance violations held not to accumulate pending diligent litigation of ordinance's validity (Kansas Supreme Court: *City of Wichita v. Home Cab Co.*, 42 Pac. 2d, 972).

Ordinance imposing license tax on food venders held void as discriminating against non-residents (Texas Court of Criminal Appeals: *Ex parte Baker*, 78 S. W. 2d, 610).

License tax imposed against drug stores upheld (Arizona Supreme Court: *City of Glendale v. Betty*, 43 Pac. 2d, 206).

Power to license auctions held not to authorize prohibition against auction sales by retail jewelers. $250 license tax against auctioneers held void as being unreasonable (Minnesota Supreme Court: *Orr v. City of Rochester*, 258 N. W. 569).

Payment of state tax held not to exempt non-resident baker from borough tax for peddling on highways (Pennsylvania, County Court, Allegheny: *Commonwealth v. Winter*, 26 Pa. Munic. Law Rep. 70).

One attacking license tax as being unreasonably excessive held not bound to tender reasonable amount (Georgia Court of Appeals: *National Line Service Corp. v. Mayor, etc., of Milledgeville*, 179 S. E. 837).

License tax exemption of "perishable farm products" held applicable to eggs and poultry (Georgia Supreme Court: *Warren v. City of Atlanta*, 177 S. E. 706).

Ordinance imposing license tax on linen supply business held not applicable to plaintiff, a non-resident (North Carolina Supreme Court: *National Linen Service Corp. v. Crisp*, 178 S. E. 93).

Ordinance held to impose separate license tax for each delivery depot maintained by laundry as well as for principal place of business (Georgia Court of Appeals: *Goldstein v. State Revenue Commission*, 178 S. E. 164).

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Municipal and Civic Publications

Prices quoted do not include postage, unless so stated

Public Works

Public Works Engineers' Yearbook 1936: *Proceedings of the American Society of Municipal Engineers and the International Association of Public Works Officials, at the* 1935 *Public Works Congress, held at Cincinnati, Ohio, October* 14-16, 1935. *Published by the Joint Secretariat,* 850 *East* 58*th Street, Chicago, Ill.*

Some words of City Manager C. A. Dykstra, of Cincinnati, in the opening address of the Congress, may serve to epitomize the importance and significance of the papers and discussions presented: "By this time we realize that public works programs cannot take up all of the slack that exists in the agricultural and industrial world. All it can do is to play a part. Meanwhile those who are giving their lives to the field of public works must accept the responsibility for helping to shape the program and its administration so that in these changing times and under varying circumstances something solid and constructive will come out of this new experience." Material was presented and discussed on city and regional planning; water supply; sewerage and sewage disposal; streets and roads; refuse collection and disposal; public utilities; street cleaning; highway lighting; traffic; airport construction; and public works financing. The panel discussion of the Federal Public Works Program, and the Works Program Clinic, as reported, are an important feature of the volume.

Housing

Housing Officials' Yearbook—1936.—Editor, *Coleman Woodbury. Published by National Association of Housing Officials,* 850 *E.* 58*th St., Chicago, Ill. X* + 244 *pp.* $2.00.

Sixty contributors, from Federal, state and local housing agencies and unofficial organizations, have made possible this 1935 review of housing activity, says the Public Administration Clearing House. Accomplishments and plans of the eight Federal agencies that have to do with housing, and of their coordinating agency, the Central Housing Committee, are described, along with the activity of the 43 official and unofficial housing agencies of states and cities. In addition, the volume contains articles on major housing problems such as the acquisition of land for projects, the training of housing managers, the demolition of unfit housing, and the possible reduction of construction costs through prefabrication. There is also a charted summary of state legislation on low-rent housing, a directory of housing agencies and of state and local housing officials, and a discussion of English housing.

The Underwriting Manual issued by the Federal Housing Administration (with revisions to April 1, 1936) sets forth underwriting and valuation procedure under Title II of the National Act, which establishes a system of mutual insurance of mortgages secured by residential property. It is announced by the Administration that the purpose of the Manual is to prescribe uniform and sound techniques, and to promote a broad understanding of the principles and procedure adopted. Part I is Underwriting Methods, including mortgage risk rating, dwelling valuation, dwelling cost estimation; Part II is Risk Rating Instructions, as to property, location, borrower, and mortgage pattern. The Manual is made available to individuals and institutions. (Apply to the Federal Housing Administration, Washington, D. C.)

Roads

Three pamphlets containing construction specifications approved by The Asphalt Institute on February 25, 1936, are as follows: (S-2) "Surface Treatment of Waterbound Surfaces"; (S-3) "Surface Treatment of Loosely Bonded Surfaces"; (B-6) "Patching, Reducing Crown and Correcting Profile" (of old surfaces which are to serve as foundations). Each 8 pp.; handy size. (Apply to The Asphalt Institute, 801 Second Ave., New York.)

Public Utilities

Public Utility Regulation and the So-Called Sliding Scale.—By Irvin Bussing, Ph. D., Department of Economics, Wesleyan University. Columbia University Press, New York. 1936. 174 $2.75.

Recognizing that the doctrine of a fair return on fair value as the prevalent basis of public utility regulation tends to do away with the supposed advantage of competition in stimulating efficiency, Dr. Bussing has made a study of one device for meeting this objection. This device, the sliding scale, which invokes the paradox of authorizing higher profits as a reward for lower rates, has had considerable use in Great Britain and more limited use in the United States and Canada. This book presents a brief study of these instances. It is of particular interest in its analysis of the "Washington plan," which has received widespread attention. The author is optimistic as to the place of the sliding scale in utility regulation, despite certain shortcomings that he discusses.

H. M. Olmsted.

Regulation of Public Utilities in New Jersey.—By M. C. Waltersdorf, Professor of Economics, Washington and Jefferson College. Waverly Press, Inc., Baltimore, Md. 1936. 233 pp. $2.50.

This is a detailed study of the process of state regulation of public utilities in New Jersey since 1910, when the Board of Public Utility Commissioners superseded the Board of Railroad Commissioners. The book is mostly descriptive of the organization and methods of the Board, with some critical comment on its regulatory procedure and policies. A concluding chapter makes various suggestions for strengthening public utility regulation, both in New Jersey and generally. The book illustrates the many difficulties in the way of effective regulation.

H. M. Olmsted.

Libraries

Libraries of the South—A Report on Developments, 1930-1935.—*By Tommie Dora Barker, Regional Field Agent for the South, American Library Association. Published by American Library Association, Chicago.* 1936. *XVI* + 215 *pp.* $1.75.

This is a record of achievement, says the American Library Association: the story of citizens' conferences to plan for better library facilities; of the effort to establish more state library extension agencies; of improved library legislation; of the expansion of school library service, and of the increase in library service to Negroes; of successful county library demonstrations and Federal projects in libraries, such as the TVA. All these show that the librarians are keenly aware of the part the library should play in the social, educational and cultural development of a people.

Subdivision Planning

In *The Architectural Record* for April appear certain articles of importance in relation to standards of subdivision planning. "The Federal Housing Administration and Subdivision Planning," is by Seward H. Mott, Chief, Land Planning Technical Section, Federal Housing Administration. This covers the minimum requirements for undeveloped subdivisions by which the FHA determines the desirability of a site. The seven requirements are carefully explained and then follows a statement of desirable standards recommended. Drawings of bad and good treatments of intersections, corners and zoning provisions are included. 6 pp.

"Modern Problems in Subdivision Work," by Charles Downing Lay, gives critical notes on selected plans of subdivisions in ten different states, with drawings and photographs. 14 pp. The presentation upholds the superiority of professional work in town planning and architecture. (Apply to The Architectural Record, 119 W. 40th St., New York.)

Sewerage

Sewerage: The Designing, Constructing and Maintaining of Sewerage Systems and Sewage Treatment Plants.—By A. Prescott Folwell, Sc.D., Past President, American Society for Municipal Improvements; Editor, "Public Works." John Wiley & Sons, Inc., New York. 1936. *Eleventh Edition. XII* + 412 *pp. Illustrated.* $4.50.

In bringing up to date the information on sewerage presented in this book, the author has revised the portion dealing with sewage treatment, and has included a new chapter on the evolution and adaptation of equipment for use in such processes. Recent data on rainfall, anticipated population of cities, and sewer design are given.

Government

American City Government and Administration.—By Austin F. Macdonald, Ph.D., Professor of Political Science, University of California. Thomas Y. Crowell Co., New York. Revised edition, 1936. *Crowell's Social Science Series, edited by Seba Eldridge, University of Kansas. XIII* + 773 *pp.* $3.75 *from* The American City.

The revision of this volume has been made to present and interpret the changes that have taken place in its field since the first edition, in 1929. There is a new chapter on The Mechanics of Reform. Those on Welfare and Housing have been almost entirely rewritten. Other topics that have been brought up to date are the relations between city and state, and between city and nation; metropolitan government; council-manager government; municipal revenues; and traffic regulation. While primarily a book for college students, its non-technical presentation holds much interest for the general reader in the discussion of present-day municipal problems.

Parks and Parkways

International Housing and Town Planning Bulletin No. 35, issued in April by the International Federation for Housing and Town Planning, contains an article in English, French and German on "Parkways and Parkway Systems in Germany," by Dr. H. Heiligenthal, Oberbaurat, Professor at the Technical High School, Karlsruhe, Germany. It discusses the various types of parkways in the neighborhood of Cologne, Dresden, Hanover, Munich, Karlsruhe, and Berlin, and the methods of acquiring, developing and protecting them. Statistical details are given for each of these cities regarding the acreage in parks and parkways devoted to housing; roads, streets, squares and railways; public parks and gardens; sports grounds; burial places; agricultural use; woods and forests; expanses of water. (Apply to the General Secretary of the Federation, Donald C. L. Murray, 25 Bedford Row, London, W.C.1, England.)

Standards for Building Materials

The National Bureau of Standards, of the U. S. Department of Commerce, has sent out a number of releases bearing the general title of "Technical Information on Building Materials," for use in the design of low-cost housing. They present, very briefly, essential facts developed through research at the Bureau, and refer to longer publications where methods of investigation and results obtained are given in greater detail. The first five releases (March 3-April 8) deal with corrosion of metals; effect of thermal insulation on fuel savings; life of non-ferrous screen wire cloth; insulating values of insulating materials and of building materials and basic wall units; and exterior waterproofing for masonry. The Bureau is also engaged in investigations of the durability of building materials used in low-cost housing, the program for which was drawn up after consultation with a special committee representing the Central Housing Committee. A circular is issued by the Bureau outlining its services to the home-building industry. (Apply to the National Bureau of Standards, Washington, D. C.)

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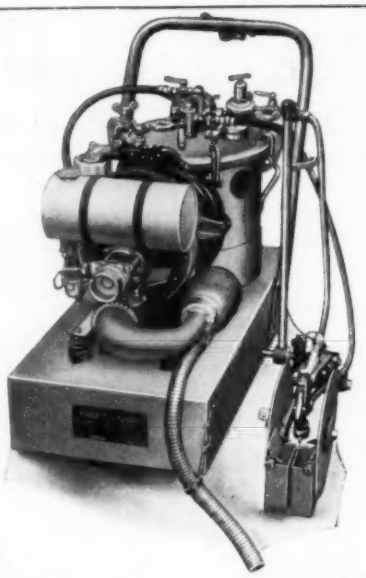

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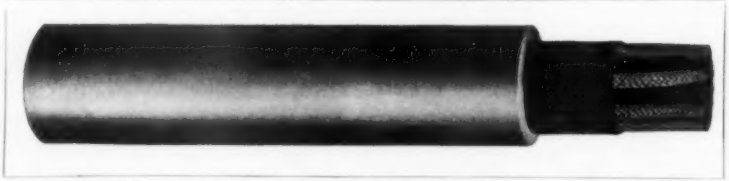

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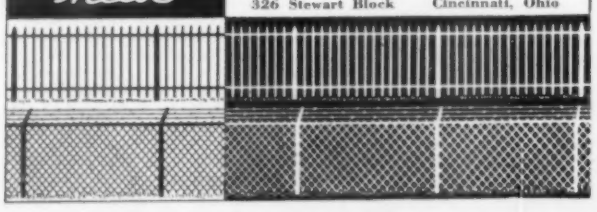

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Sewers

"Sanitary Sewers, Nassau County" is a report made to the Nassau County Sanitation Commission, by Clarence MacCallum, Consulting Engineer, December 23, 1935. 160 quarto pp., folding maps; charts, tables. (Apply to the Commission, Mineola, N. Y.)

Drainage

"A Comprehensive Drainage Plan for Nassau County, New York," has been prepared by W. Fred Welsch, Assistant Engineer, Nassau County Sanitation Commission, in collaboration with the Department of County Engineer, W. Fred Starks County Engineer, and coordinated with the comprehensive sanitary sewerage plan prepared by Clarence MacCallum, Consulting Sanitary Engineer. 25 quarto pp. Large folding maps. December 23, 1935. (Apply to Nassau County Sanitation Commission, County Court House, Mineola, N. Y.)

Planning

The First Annual Report of the Maine State Planning Board, covering the planning procedure and research of the Board for the year ending March 15, 1935, though delayed in publication, is no less authentic and valuable as a compendium of the state's resources, on which a program of social, physical and economic development is being based.

Samuel Stewart, of Lewiston, is Chairman of the State Planning Board of six representative citizens. The National Resources Board furnished the services, as state planning consultants, of Professor Arthur C. Comey, of Cambridge, Mass., and Captain Alfred Mullikin, of Northeast Harbor, Maine, under whose direction the report has been prepared. The cooperation of many individuals, corporations and state agencies has enabled the technical staff to compile and correlate a great amount of information on diverse subjects all bearing on the interests of the Maine of today, and available nowhere else in a single volume. Its point of view is statewide; its application of local value; its interest reaches to the general reader, who knows, or yet may seek to know, the varied attractions and advantages of the state. Copyright. $2.50. C.O.D. by mail. (Apply to Maine State Planning Board, Augusta, Maine.)

The National Resources Committee has recommended the immediate creation of a Federal corporate power agency in the Columbia Basin and early consideration of other development problems affecting the Pacific Northwest. These recommendations are based on an analysis of the report (May, 1936) of the Pacific Northwest Regional Planning Commission, which deals with urgent problems in the Columbia Basin, and particularly with the policies and organization which should be provided for planning, construction and operation of certain public works in that area. The report contains XXVI + 192 quarto pages, with many maps and tables. Paper cover; 50c. (Apply to Superintendent of Documents, Washington, D. C.)

Crime

The Attorney General's Conference on Crime was held December 10-13, 1934, in Washington, D. C., and its Proceedings have been printed in full in a volume of XIX + 578 pages, including also a list of delegates to the Conference, and a list of the organizations represented. The material is comprehensively indexed. Hon. Homer Cummings, Attorney General, states in the Foreword that never before, in this country at least, has there been brought together a group of persons so well qualified by reason of research, actual experience, or both, to discuss the various phases of the crime problem. Instead of separate sessions on the various phases of the work, attended in each case by those especially concerned with the topics discussed, the programs were planned to give cross-sectional views of the larger aspects of the problem of crime control, and the sessions were attended by representatives of all professional groups and of outstanding civic and scientific associations, meeting together. The book contains material of permanent value, now made readily available. (Apply to the Office of the Attorney General, Washington, D. C.)

Government

The report of the Committee on Governmental Simplification for Los Angeles, County, Calif., was prepared in 1935 as the result of a survey made by a semi-official body of 40, representing units of government and many civic and commercial groups. It deals primarily with matters of organization, duties and relationships, and only incidentally with fiscal affairs, difficulties in which the Committee considers to be the result of inadequate governmental organization. The conclusions and recommendations are broad in scope, and definite in statement, resting upon the work of special committees on general government, finance, law, public works, protection to persons and property, health, charities, education, and recreation, presented in much detail, with many charts, maps and tables, in a volume of 219 mimeographed pages. (Apply to the Committee on Governmental Simplification, Los Angeles, Calif.)

The Citizens' Bureau of Milwaukee, Wis., has reprinted a study of economic unity and political decentralization entitled "Metropolitan Milwaukee—One Trade Area Burdened with 93 Local Governments," submitted by the Joint Committee on Consolidation in Milwaukee County. The research work was directed by Mrs. Paula Lynagh, a staff member of the Bureau, as a project of WERA and WPA. Handy size. 97 pp.; maps, charts, tables. (Apply to Joint Committee on Consolidation, Milwaukee, Wis.)

Legal Notes on Local Government

The May issue of *Legal Notes on Local Government*, published by the Section on Municipal Law of the American Bar Association. It is noted that, by direction of the Executive Committee of the Association, this publication is to be continued during the coming year as a bi-monthly. It will be distributed to all members of the Section on Municipal Law. The annual subscription price to non-members of the Association is $6.00. (Apply to Charles W. Tooke, Chairman, Municipal Law Section, American Bar Association, New York University School of Law, New York City.)

Police

Street accidents in New York City in 1935 totaled 35,332, compared with 44,544 in 1934, according to Police Commissioner Lewis J. Valentine's annual report for 1935. This is a drop of 35 per cent; but deaths totaled 1,032, compared with 1,097 the year before, a drop of only 6 per cent. Principal causes of the fatalities were:

	1935	1936
Pedestrians crossing against lights..	254	225
Crossing not at crossing.....	178	229
Collisions of vehicles.....	140	171
At crossing	131	137
Running off sidewalk into road....	53	39

Radio Station WPY was reinstalled, so that ships within 20 miles of the city can communicate with Headquarters. Ten police boats are equipped with radio, compared with two in 1934. Of the 496 automobiles now equipped, against 390 in 1934, there are 401 with battery eliminators, against 200 thus equipped the year before. There are 318 radio patrol cars active in the city. Radio arrests totaled 4,946 last year, compared with 4,641 the preceding year.

Industrial Fuels

The papers presented as a Symposium on Industrial Fuels, held in Philadelphia on January 21, 1936, has been printed under that title in a pamphlet of 70 pages, published by the American Society for Testing Materials. The meeting was sponsored jointly by the Society and the Engineers Club of Philadelphia. The papers were prepared according to a prescribed outline so as to have considerable comparative value. The subjects include: future availability of raw materials; possibility of new processes; tests applied to the materials, and their significance; utilization of materials; general economic aspects of the product and its utilization. 75c; 10 or more copies, 60c each. (Apply to the American Society for Testing Materials, 260 Broad St., Philadelphia, Pa.)

Street Lighting

Street lighting, like all else that is performed with equipment, has been improving through the years, but never before with such strides as now. A vast amount of equipment has been developed and improved, as is illustrated by the catalog, "Street Lighting Equipment," published by Line Material Co., of South Milwaukee, Wis. In addition to the many items listed, there is a section on the fundamentals of scientific street lighting, which states the points to be considered in the selection of equipment, and certain other essentials of illuminating engineering. 163 pp. No charge. (Apply to the publishers.)

Housing

"An Outline for a Housing Study Course" in 10 sessions has been prepared by the Educational and Publicity Committee of the Housing Section, Welfare Council of New York City. It is intended to be used experimentally in classrooms to help high school pupils to understand and appreciate the importance of decent housing in their own family life, and to show them how they may take a part in securing such housing. The Board of Education of New York City has approved the preparation of the syllabus, and the Committee hopes to gain constructive criticism from its use before putting it in final form in the teaching of housing as part of high school social studies. 50 mimeographed sheets, in paper cover. 35c.

The Welfare Council of New York City also presented in March, 1936, a "Bibliography on Low-Cost Housing," which was compiled by Maria Johanna Schuster, Librarian. This was a WPA project, conducted under the supervision of the Welfare Council.

(For both, apply to Welfare Council of New York City, 122 E. 22d St., New York.)

The rental limits of Hillside Housing, in the Borough of the Bronx, New York City, are $11 per room. This is PWA's first limited-dividend housing project, and accommodates 1,400 New York families with provisions for better living. Clarence S. Stein is the architect. How the needs of the community were analyzed and met in the planning of this integrated community of apartments is told in a finely illustrated 20-quarto page pamphlet reprint from the *American Architect* for February, 1936. (Apply to American Architect, 572 Madison Ave., New York.)

Planning

The first number of *Missouri Planning Digest* (May, 1936) has been issued by the Missouri State Planning Board. This monthly news bulletin will be edited by the Planning Board staff under the supervision of two consultants and with the general approval of the Board. The May number consists of 6 mimeographed pages. (Apply to the Board, Jefferson City, Mo.)

Other Reports Received

CINCINNATI, OHIO.—"Municipal Activities, 1935." 69 pp.

ERIE, PA.—Annual Report, Department of Accounts and Finance, January 6, 1936. 66 pp.

ERIE, PA.—"Budget for 1936." 47 pp.

FREDERICKSBURG, VA.—Annual Report, 1935. 64 pp.

GARDINER, MASS.—Annual Report, the Water Department. 18 pp.

LYNCHBURG, VA.—Annual Report, 1935. 44 pp.

MILWAUKEE, WIS.—"Municipal Activities, 1935." 157 pp.

MINNEAPOLIS, MINN.—"Budget Facts and Financial Statistics for 1936," by Board of Estimate and Taxation. 40 pp.

OAK PARK, ILL.—Annual Report, Department of Public Works, 1935. 86 pp.

OAK PARK, ILL.—Annual Report, Water Department, 1935. 22 pp.

PROVIDENCE, R. I.—Annual Report, City Auditor, year ending September 30, 1935. 186 pp.

PROVIDENCE, R. I.—Annual Reports, the City Plan Commission, 1932-1935. 66 pp.

PROVIDENCE, R. I.—Annual Reports, Local, Federal and State Relief Administration, and Reports, Director of Public Aid and Local Director of Mothers' Aid. 47 pp.

SALEM, MASS.—Annual Report, Park Department, 1935. 38 pp.

VERSTMOUNT, QUE.—Annual Reports, 1935. 46 pp.

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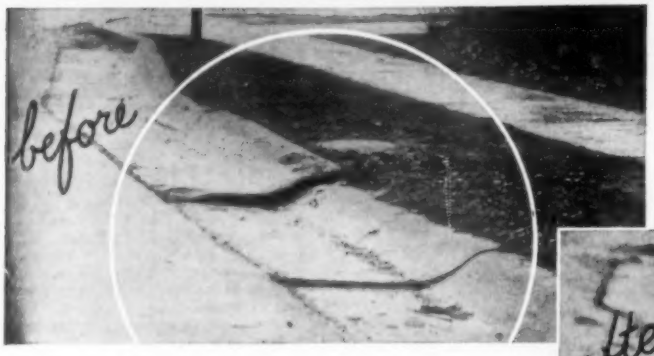

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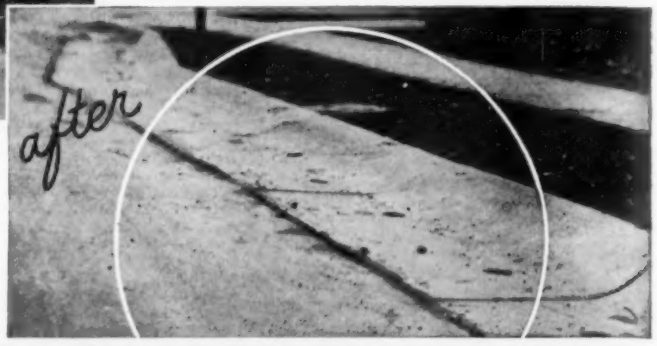

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Conventions -- When and Where

(Figures in parentheses following the name of the convention city indicate the estimated attendance other than local)

JUNE 8-12.—LOS ANGELES, CALIF.
American Water Works Association. Annual convention. (Hotel Biltmore.)

JUNE 8-9.—ALAMOSA, CALIF.
Colorado Municipal League. Annual meeting. Secretary-Treasurer, Don C. Sowers, University of Colorado, Boulder, Colo.

JUNE 9-12.—WASHINGTON, D. C.
National Conference on Weights and Measures. Annual conference. Secretary, F. S. Holbrook, Bureau of Standards, Washington, D. C.

JUNE 10-12.—DETROIT LAKES, MINN.
League of Minnesota Municipalities. Annual convention. Executive Secretary, C. C. Ludwig, University of Minnesota, Minneapolis, Minn.

JUNE 11-12.—ELGIN, ILL. (100)
Illinois Association of Sanitary Districts. Annual meeting. (Fox Hotel.) Secretary-Treasurer, G. H. Radebaugh, Urbana-Champaign, Ill.

JUNE 12-13.—WILLIAMSPORT, PA. (75)
Pennsylvania Association of Planning Commissioners. Annual convention. Secretary-Treasurer, Arthur Cassell, City Planning Commission, Allentown, Pa.

JUNE 15-19.—LOS ANGELES, CALIF.
Institute of Government. Annual session. (University of Southern California.) Executive Secretary, Prof. W. Ballentine Henley, School of Government, 3551 University Avenue, Los Angeles.

JUNE 16-18.—SHAMOKIN, PA.
Pennsylvania State Association of Boroughs. Annual convention. Secretary, J. Herman Knisely, 2107 Derry Street, Harrisburg, Pa.

JUNE 17-18.—REGINA, SASK. (125)
Saskatchewan Urban Municipalities Association. Annual convention. Secretary-Treasurer, W. E. Hodge, 503 Scott Block, Moose Jaw, Sask.

JUNE 22-26.—PASADENA, CALIF.
American Institute of Electrical Engineers. Annual summer convention. National Secretary, H. H. Henline, 33 West 39th Street, New York.

JUNE 22-23.—VANCOUVER, B. C. (75)
Conference of State and Provincial Health Authorities of North America. Secretary, Dr. A. J. Chesley, State Board of Health, St. Paul, Minn.

JUNE 23-25.—HARTFORD, CONN.
New England Association of Fire Chiefs. Annual convention. Secretary-Treasurer, John W. O'Hearn, 99 Main Street, Watertown, Mass.

JUNE 24-26.—LETHBRIDGE, ALTA.
Union of Alberta Municipalities. Annual convention. Secretary-Treasurer, J. E. Fraser, Wetaskiwin, Alta.

JUNE 24-26.—VANCOUVER, B. C. (300)
Canadian Public Health Association. Annual meeting. General Secretary, Dr. J. T. Phair, Spadina House, Toronto, Ont.

JUNE 24-26.—STATE COLLEGE, PA.
Pennsylvania Sewage Works Association. Annual conference. Secretary, L. D. Matter, Kirby Health Center, Wilkes-Barre, Pa.

JUNE 25-27.—OQUAGA LAKE, N. Y.
New York State Secretaries' Conference. Annual convention. Secretary-Treasurer, J. Kennard Johnson, Chamber of Commerce, Binghamton, N. Y.

JUNE 26-27.—PITTSFIELD, MASS.
New England Association of Commercial Executives. Annual meeting. Secretary, Peter Foley, Norwich, Conn.

JUNE 26-28.—STATE COLLEGE, PA.
Pennsylvania Water Works Operators' Association. Annual convention. Secretary-Treasurer, I. M. Glace, 20 South 22d Street, Harrisburg, Pa.

JUNE 28-JULY 2.—PORTLAND, ORE. (10,000)
National Education Association of the United States. Annual meeting. Secretary, Willard E. Givens, 1201 16th Street N. W., Washington, D. C.

JULY 15-18.—PORTLAND, ORE.
American Society of Civil Engineers. Annual convention. Secretary, George T. Seabury, 33 West 39th Street, New York.

JULY 15-17.—RAPID CITY, S. DAK.
League of South Dakota Municipalities. Secretary, G. R. Breckenridge, University of South Dakota, Vermillion, S. Dak.

JULY 20-24.—STILLWATER, OKLA.
Oklahoma Water and Sewage Conference. Annual conference. Secretary-Treasurer, H. J. Darcy, State Sanitary Engineer, Oklahoma City, Okla.

JULY 21-24.—TORONTO, ONT.
International Association of Fire Chiefs. Annual convention. (Royal York Hotel.) Secretary, James J. Mulcahey, Yonkers, N. Y.

JULY 21-23.—NORRISTOWN, PA. (250)
Pennsylvania Chiefs of Police Association. Annual convention. Secretary, F. B. Titus, Lansdowne, Pa.

JULY 27-29.—VANCOUVER, B. C.
Union of Canadian Municipalities. Annual meeting. Secretary-Treasurer, Mrs. J. S. Giles, Lachute, Que.

JULY 28-30.—GLENS FALLS, N. Y. (250)
New York State Association of Chiefs of Police. Annual convention. Secretary-Treasurer, James L. Hyatt, 503 Western Avenue, Albany, N. Y.

AUGUST 2-8.—EVANSTON, ILL.
National Institute for Commercial and Trade Organization Executives. Annual session. (Northwestern University.) Secretary, John N. Van der Vries, 607 First National Bank Building, Chicago, Ill.

AUGUST 6-7.—POUGHKEEPSIE, N. Y. (1,000)
Eastern Association of Fire Chiefs. Annual convention. Secretary, Charles E. Clark, Box 217, Wayne, Pa.

AUGUST 18-20.—DAVENPORT, IOWA. (400)
League of Iowa Municipalities. Annual convention. Secretary-Treasurer, Frank G. Pierce, Marshalltown, Iowa.

AUGUST 19-21.—CLEVELAND, OHIO.
American Water Works Association—Central States Section. Annual meeting. (Hotel Cleveland.) Secretary, H. L. Nelson, 2435 Koppers Building, Pittsburgh, Pa.

AUGUST 31, WEEK OF.—BUFFALO, N. Y.
Illuminating Engineering Society. Annual convention. (Statler Hotel.) General Secretary, D. W. Atwater, 29 West 39th Street, New York.

AUGUST 31-SEPTEMBER 3.—NEW YORK CITY. (350)
National Municipal Signal Association. Annual convention. Secretary, W. H. Harth, Columbia, S. C.

SEPTEMBER 2-4.—BOSTON, MASS.
National Shade Tree Conference. Annual convention. (Hotel Statler.) Secretary-Treasurer, Dr. R. P. White, New Jersey Agricultural Experiment Station, New Brunswick, N. J.

SEPTEMBER 2-4.—DIGBY, NOVA SCOTIA.
Union of Nova Scotia Municipalities. Annual convention. Secretary, Hon. Arthur Roberts, Bridgewater, N. S.

SEPTEMBER 2-4.—TORONTO, ONT.
Ontario Municipal Association. Annual meeting. Secretary-Treasurer, H. L. Brittain, 137 Wellington Street W., Toronto, Ont.

SEPTEMBER 7-12.—WASHINGTON, D. C.
Third World Power Conference. Executive Secretary, Joel David Wolfsohn, National Power Policy Committee, Department of the Interior Building, Washington, D. C.

SEPTEMBER 9-12.—EAGLES MERE, PA. (250)
American Forestry Association. Annual meeting. Executive Secretary, Ovid Butler, 1727 K Street N. W., Washington, D. C.

SEPTEMBER 14-17.—SANTA MONICA, CALIF. (1,000)
League of California Municipalities. Annual convention. Secretary, Richard Graves, 223 City Hall, San Francisco, Calif.

SEPTEMBER 14-17.—SANTA MONICA, CALIF.
California Sewage Works Association. Annual convention. Secretary, Fred D. Bowlus, 202 Law Building, Los Angeles, Calif.

SEPTEMBER 16-17.—PARIS, KY.
The Kentucky Municipal League. Annual convention. Executive Secretary, Carl B. Wachs, Municipal Building, Lexington, Ky.

SEPTEMBER 17-19.—DANVILLE, ILL. (500)
Illinois Municipal League. Annual convention. Secretary, A. D. McLarty, 500 East Capitol Avenue, Springfield, Ill.

SEPTEMBER 21-23.—DENVER, COLO.
American Country Life Association. Annual conference. (Cosmopolitan Hotel.) Executive Secretary, Benson Y. Landis, 105 East 22d Street, New York.

SEPTEMBER 21-23.—CINCINNATI, OHIO. (350)
American Institute of Park Executives and the American Park Society. Annual convention. Executive Secretary, William H. Walker, 2234 Inglewood Place, South Bend, Ind.

SEPTEMBER 21-24.—WHITE SULPHUR SPRINGS, W. VA. (1,000)
American Transit Association and affiliated organizations. Annual convention. General Secretary, Guy C. Hecker, 292 Madison Avenue, New York.

SEPTEMBER 21-23.—DENVER, COLO.
American Water Works Association Rocky Mountain Section. Annual meeting. (Cosmopolitan Hotel.) Secretary-Treasurer, B. V. Howe, 137 State Office Building, Denver, Colo.

SEPTEMBER 21-24.—KANSAS CITY, MO.
International Association of Chiefs of Police. Annual convention. Secretary, George Black, Wilmington, Del.

SEPTEMBER 22-25.—NEW YORK CITY.
New England Water Works Association. Annual convention. (Pennsylvania Hotel.) Secretary, Frank J. Gifford, 613 Statler Building, Boston, Mass.

SEPTEMBER 24-25.—MANITOWOC, WIS.
League of Wisconsin Municipalities. Annual convention. Secretary, Frederick MacMillin, 114 North Carroll Street, Madison, Wis.

SEPTEMBER 28-30.—TORONTO, ONT.
American Society of Municipal Engineers. International Association of Public Works Officials. Public Works Congress. Executive Director, Frank W. Herring, 850 East 58th Street, Chicago, Ill.

OCTOBER 3.—WELLESLEY, MASS. (100)
Massachusetts Federation of Planning Boards. Annual conference. Secretary, Henry B. Alvord, 316 Huntington Avenue, Boston, Mass.

OCTOBER 5-9.—ATLANTIC CITY, N. J.
National Safety Council. Annual Safety Congress and Exposition. Managing Director, W. H. Cameron, 20 North Wacker Drive, Chicago, Ill.

OCTOBER 12-15.—FORT SMITH, ARK.
American Water Works Association—Southwest Section. Annual convention. (Hotel Goldman.) Secretary-Treasurer, Lewis A. Quigley, Fort Worth, Texas.

OCTOBER 14-17.—CINCINNATI, OHIO.
Civil Service Assembly of the United States and Canada. Annual assembly. Director, G. Lyle Belsley, 850 East 58th Street, Chicago, Ill.

OCTOBER 14-16.—ATLANTIC CITY, N. J.
Pennsylvania Water Works Association. Annual convention. (Haddon Hall.) Secretary, Dr. F. Herbert Snow, 327 Telegraph Building, Harrisburg, Pa.

OCTOBER 19-21.—RICHMOND, VA. (200)
International City Managers' Association. Annual convention. Executive Director, Clarence E. Ridley, 850 East 58th Street, Chicago, Ill.

OCTOBER 20-23.—NEW ORLEANS, LA.
American Public Health Association. Annual meeting. Executive Secretary, Dr. Reginald M. Atwater, 50 West 50th Street, New York.

OCTOBER 26-28.—KANSAS CITY, MO.
American Water Works Association—Missouri Valley Section. Annual meeting. Secretary, Earl L. Waterman, University of Iowa, Iowa City, Iowa.

OCTOBER 26-28.—CHARLOTTE, N. C.
American Water Works Association—North Carolina Section. Annual convention. (Hotel Charlotte.) Secretary, M. F. Trice, State Board of Health, Raleigh, N.C.

. . . . . It's Ready!

A New Heil bulletin illustrating and describing Heil dump units for Garbage and Refuse collection is now ready for distribution.—Take the time right now to send for your free copy.—Heil dump units are powerful and dependable they are built and backed by a 35-year-old manufacturing organization.—Get Heil recommendations before you buy —address your inquiries to:

THE HEIL CO.

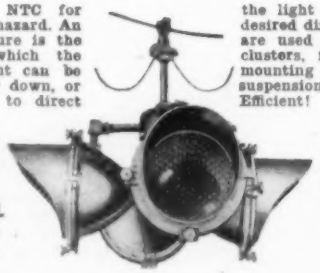
FACTORY AND GENERAL OFFICES
3000 W. MONTANA ST. MILWAUKEE

"Branches and Distributors Everywhere"

NEWEST DESIGN

NTC FLASHING BEACONS

There's an NTC for every traffic hazard. An unusual feature is the ease with which the beam of light can be turned up or down, or horizontally, to direct the light rays in any desired direction. Units are used singly or in clusters, for side arm mounting or overhead suspension. Economical! Efficient!



Write for circular giving complete details and prices.

Good territory now open for representation.

NATIONAL TRAFFIC CONTROL CO.

FOSTORIA, OHIO U. S. A.

ONE-HAND MOWING!

FOR park and boulevard lawns—where trees, walks, flower beds and shrubs make ordinary power-mowing difficult—the "one-hand" Lawn-Boy works speedily and does a *complete* job. Cuts 18" swaths, works 6" closer to trees, etc., than hand-mower, trims steep terraces easily. Daily fuel only 20c; light weight only 95 lbs., won't pack soil. Free-wheeling. 4 cutting heights, automatic start-stop control. Rubber tires optional at moderate cost. Only $110 f.o.b. Milwaukee.

EVINRUDE LAWN-BOY Power Mower

Free folder • Write today

Evinrude Lawn-Boy
1557 W. Hope Ave.
Milwaukee, Wisc.

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COMPLETE INSTALLATIONS FOR ANY SIZE BUREAU
Filing Cabinets — Guide Cards — Cameras — Microscopes
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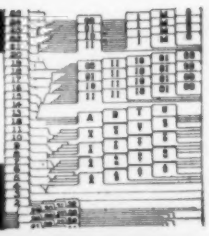
INTERNATIONAL POLICE RESEARCH BUREAU
BOYER BUILDING DETROIT, MICHIGAN



SAVE $300 TO $500 EACH MONTH MAKING YOUR OWN REPAIRS WITH THE NEW "SIMPLIFIED" ARC WELDING

In thawing underground water pipes, repairing boilers, and other maintenance work, the new Hobart 40-Volt Welder lets you do it better at a fraction of present cost. Your own men can operate.

30 DAYS TRIAL AT OUR RISK

lets you convince yourself that you can easily pay for a Hobart in savings. If present budgets will not allow its purchase, special terms can be arranged. Write today for complete details on how you can put this Hobart to work without a cent of cost.

HOBART BROS. BOX AC-66 TROY, OHIO

News and Illustrations

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

Caterpillar Official Speaks to Road Men

H. P. Mee, Vice-President of the Caterpillar Tractor Co., Peoria, Ill., paid tribute to road builders in a recent address before a large gathering of contractors and township, county and state highway officials attending the 1936 Machinery Show at Peoria, Ill.

One sure sign of the progressiveness of any state is the extent and condition of its road system. The highways of the North suffered the rigors of the winter, of the West, the sweep of dust storms, the South, torrential rains. But these problems only encouraged the road builder to better efforts. Mr. Mee continued. "I pay this tribute not only to those who use the roads and who pay the cost of building and keeping them up, but to you men who have to shoulder the responsibility of doing the job."

Better roads have been made possible by better machinery, Mr. Mee added, and such machinery is obtainable only by the employment of the best workmen to produce it. The aim of the Caterpillar Company has been to contribute to the good roads of this country the best possible equipment, and to that end the company has endeavored to provide the best of working conditions for the carefully selected workmen who produce Caterpillar machines.

Sales Expansion of Union Water Meter Co.

The Federated Sales Service, Inc., 729 Boylston Street, Boston, Mass., has been selected by the Union Water Meter Co., of Worcester, Mass., to assist it in building up a national sales organization of manufacturers' representatives to contact municipalities, state governments and the plumbing trade. Union Water Meter Co. is an old-established firm, incorporated in 1868, manufacturing water meters, corporation cocks, curb and cellar cocks, pressure regulators, copper pipe fittings, chronometer valves, etc.

Manufacturers' representatives interested in this sales franchise for their territory should get in touch with The Federated Sales Service, Inc.

Estabrook Associated with Burlingame & Hitchcock

Joseph B. Estabrook, civil engineer, formerly with the Pillsbury Engineering Co., is now associated with Burlingame & Hitchcock, Inc., consulting engineers, 521 Sexton Building, Minneapolis, Minn. Mr. Estabrook will practice in the engineering fields of sewers, sewage treatment, water development and treatment, bridge and structural design, paving and allied work.

H. P. MEE, VICE-PRESIDENT OF CATERPILLAR TRACTOR CO.

Pressure-Formed Panels of Open Steel Flooring

A type of open steel flooring which is used for subway grating, in power plants, and on bridges has been developed by the Hendrick Manufacturing Co., Carbondale, Pa. This Mitco open steel flooring is not a bolted or riveted grating; nor is it a welded grating. Mitco panels are pressure-formed without the use of mechanical locking devices. Carefully selected square-edge steel bars of definite chemical and physical properties are used. The bearing bars are prepared with a dovetail to receive the cross or transverse bars. Under hundreds of tons of hydraulic pressure, the transverse bars are pressed into the bearing bars so that the metal in the transverse bars completely fills the dovetails in the bearing bars.

As the dovetails in the bearing bars are always above the neutral axis and are completely filled by the transverse bars, the strength of the full section is developed. The transverse bars, extending below the neutral axis, not only serve as struts but also provide transverse strength, firmly locking the panel into an integral unit, distributing concentrated loads over the entire panel and preventing lateral deflection.

These panels give maximum light and ventilation and do not retain dirt or refuse, because only square-edge bars are used. The panel surfaces are level and they have a high rating from the standpoint of non-slipping and non-clogging surface.

Westinghouse Moves New York Office

The Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa., and the Westinghouse Electric International Co., and the Westinghouse Lamp Co., have announced the removal of their New York executive and sales office to the Westinghouse Building, 150 Broadway, New York.

THE MULHOLLAND CHLORINATION STATION OF THE DEPARTMENT OF WATER AND POWER OF LOS ANGELES, CALIF.

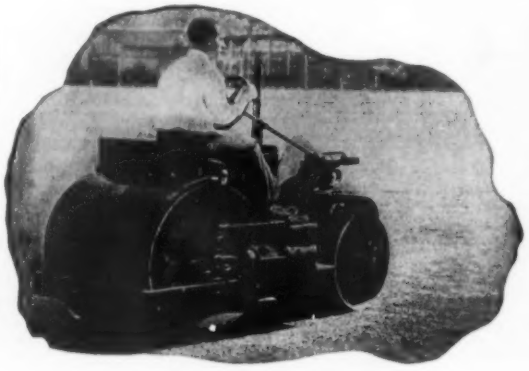
This station is designed to treat 65 million gallons of water daily and is equipped with six Wallace & Tiernan automatic vacuum chlorinators, each having a capacity of 300 pounds of chlorine per 24 hours. This is a typical example of the latest type of chlorination station in the Los Angeles water-works system

South Bend

Street Flushers, Street Sprinklers

Bituminous Material Distributors
Traffic Line Markers

Manufactured by
MUNICIPAL SUPPLY COMPANY
South Bend, Indiana



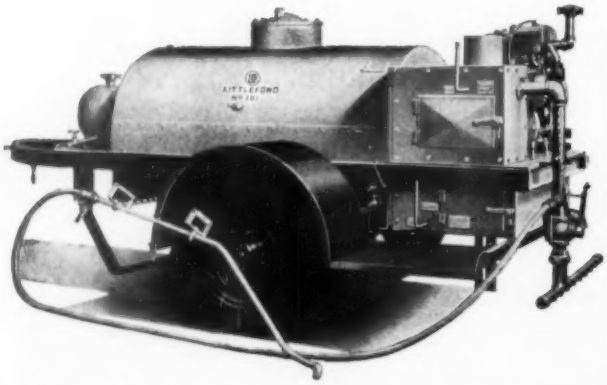
Pierce Power Rollers

for Street and Park Maintenance

Cities all over the United States and Canada are using Pierce Rollers for light construction work and for maintenance of streets and alleys. These Rollers are also ideal for leveling drives in parks and for rolling park lawns. They offer the most practical means of keeping tennis courts, playgrounds, race tracks, athletic fields and airports in proper condition.

Built in three serviceable models: ¾, 1½-2, and 3-ton. You save money when you buy Pierce Rollers. Write for information.

The Pierce Governor Company
Anderson, Indiana



No. 101 UTILITY SPRAYER

Contractors and highway departments are saving 30% on cost of material and an equal saving in time on the bituminous road surface maintenance by using bulk material in the No. 101 Littleford Sprayer. Find out about this big-time maintenance outfit for handling all kinds of bitumen.

LITTLEFORD
Road-Maintenance Equipment
SINCE 1900
LITTLEFORD BROS., 500 E. Pearl St., Cincinnati, O.

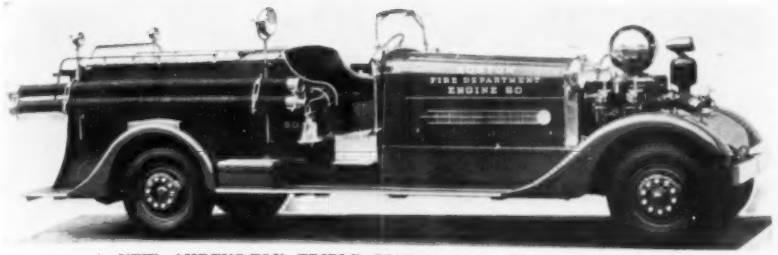
Parking Tax-O-Meter

is the answer to the
DOWNTOWN *Parking* PROBLEM

CITY, Merchant and Motorist all benefit by the installation of this newest parking device. • Send for comprehensive folder giving survey showing how costly inadequate control of downtown parking is to city and merchant—and how the Tax-O-Meter plan will solve this problem.

•NOTE: Applications for sales franchises and distributorship agencies will be considered for territories not assigned.

Parking Tax-O-Meter CORPORATION
804 Security Building
Long Beach, California



A NEW AHRENS-FOX TRIPLE PISTON TYPE PUMPER RECENTLY DELIVERED TO THE CITY OF BOSTON, MASS.

Boston Fire Department Buys Piston Type Pumper

A fire department pumper with greater reserve capacity made more attractive by streamlining and thoroughly revised to endure pump pressures compatible with the requirements of taller structures, has recently been bought by the city of Boston from the Ahrens-Fox Fire Engine Co., Cincinnati, Ohio. This Ahrens-Fox twin triple piston type pumper has been put through many tests with complete satisfaction.

Powered with a new dual valve 6-cylinder engine, designed and built at the Ahrens-Fox factory, it is interesting to note that excessively high rotative speeds are not essential to realizing either the maximum volume of discharge nor the pressures which fall within the scope of the twin triple fire pumps. Nominally rated at 1,000 gpm, the pumping performance exacted by the National Board of Fire Underwriters does not appreciably tax the ultimate capacity of the unit.

The manufacturer states that the efficiency of this unit is not only higher but, unlike other types, its efficiency is maintained over far wider variations in volume of discharge and the pump pressures to be sustained. The engine and pump speeds check up closely with the measured displacement of the pistons in both low and high working pressures. This is conducive to economy in fuel consumption and also reduces wear and tear on the parts concerned with the production of effective fire streams.

Nine Mile Run Bridge First to Be All Steel

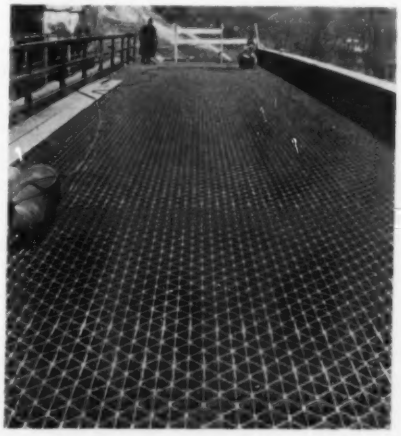
When the recent Pittsburgh flood floated away the wooden deck of the bridge over Nine Mile Run, the whole community was isolated and without access by fire apparatus or other motor transport until the span could be put back into service. Speedy repair was necessary, and it was essential that the repair be permanent and adequate up to the limit of the original girders. A wood floor would have been subject to the flood hazards and also have a comparatively short life. A concrete floor would have added too much weight to the old span and would have taken weeks to complete.

The problem was solved by using Blaw-Knox-Irving bridge flooring which completed the permanent repair in three weeks and increased the capacity and safety of the bridge. The new floor is neat in appearance owing to the uniformity of shape and spacing of the members. There is a complete absence of crown, not necessary for drainage with an open floor of this type. It is free from skidding, maintains itself clean, is quiet and rides smoothly. It does not catch or hold snow, ice, mud or other things which interfere with safe driving. It lays flat on the stringers and does not transmit or amplify rattles.

On this bridge the longitudinal members are 2½ by 3/16-inch of a steel having a yield point of 47,000 pounds. These members are spaced 2½ inches on centers. The spacing members are 1¼ x 3/16-inch and are riveted to the longitudinal members at every intersection. The floor was delivered to the bridge in units approximately 25 inches wide and 25 feet long.

The ends of the longitudinal members are staggered two spaces of the transverse members and are offset 6 inches from the end, so that the lap joint rivets together, making the grid continuous for as long a distance as is desired. The joints between intermediate sections are made by riveting the longitudinal bar side of one section to the transverse bar side of the adjacent section as the floor is laid.

This flooring is built for modern highway bridge specification loadings, and tables are available to show what joint spacing should be used for each weight of rear wheel. Sizes and spacing of main stringers, panel length arrangements, floor-beam sizes and all such general features of the design are still at the discretion of the designing engineer, and any combination that he may select on a new span, or find existent on a span that is to be repaired, can be used without change, and a proper arrangement of Blaw-Knox-Irving floor and supporting joists be made to suit the condition.



THE BLAW-KNOX-IRVING OPEN FLOORING ON THE NINE-MILE RUN BRIDGE AT PITTSBURGH, PA.

Plans and Specifications for Rock Asphalt Surfaces

The Kentucky Rock Asphalt Institute, 719 Marion E. Taylor Building, Louisville, Ky., has recently issued a booklet giving plans and specifications for Kentucky rock asphalt surfaced tennis courts, playgrounds, sidewalks, driveways, and combination playgrounds, which can on short notice be converted into tennis courts, volley-ball and basketball courts. Playgrounds, tennis courts, etc., surfaced with Kentucky rock asphalt have proved very successful from the standpoint of attractiveness and economic maintenance.

Among the outstanding advantages of playgrounds and courts surfaced with Kentucky rock asphalt is their cleanliness. Several schools, so equipped, have reported a reduction in janitor forces, for the new surface requires practically no work to keep it clean and sanitary and there is no tracking of mud into the buildings. This material retains its smooth grade without maintenance, is waterproof and may be hosed off. It is immediately usable after rain or flushing, and retains court markings for long periods. The surface is non-glaring and easy on the eyes, and resilient under the players' tread, and affords the maximum resistance to slippage of all surfacing materials.

The plans included in this pamphlet have been made for six types of cross-section, in order to provide for the use of local materials where possible, and to provide economic advantages in figuring costs. A copy may be secured direct from the Institute.

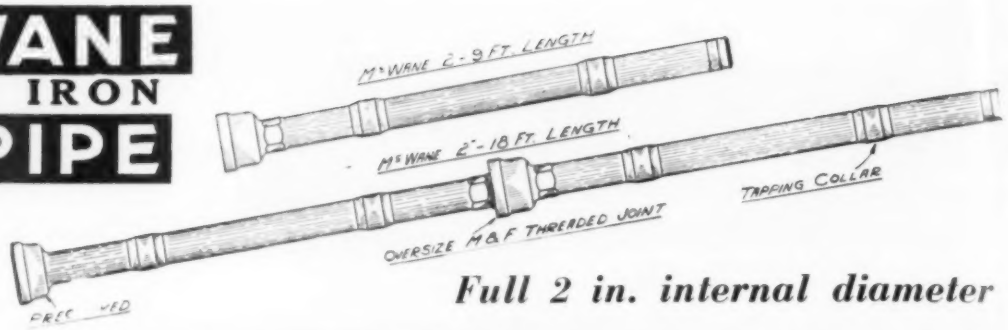
New Cutler-Hammer Office for Maryland

Cutler-Hammer, Inc., 12th and St. Paul Ave., Milwaukee, Wis., manufacturer of electric control apparatus, has announced the opening of a new office in Baltimore, Md., to better serve customers in the states of Maryland and Virginia. The new office is at 10 West Chase Street, Baltimore, and will operate under the supervision of the Philadelphia District Office. It will be in charge of R. A. Haworth.

Guiry at Chicago Office of Kennedy Valve

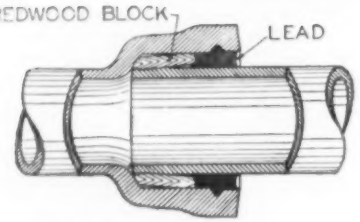
The Kennedy Valve Manufacturing Co., Elmira, N. Y., manufacturer of valves, pipe fittings and fire hydrants, has announced the appointment of R. M. Guiry as Manager of its Chicago branch office and warehouse. Mr. Guiry has been connected with the Kennedy Chicago office for the last nine years.

McWANE CAST IRON 2" PIPE



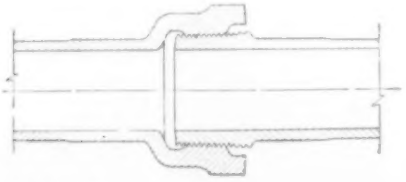
Full 2 in. internal diameter

CAST IN 9 FT. LENGTHS



McWANE
IMPROVED PRECALKED JOINT

Yes, the Precalked Joint is in the bell, ready to finish on the job. No lead pouring. Nothing to buy. Just socket the spigot and finish calking. Self-tightening! Positive! Speedy! Permanent!



McWANE
MALE & FEMALE THREADED JOINT

All assembled sections have this Oversize Male and Female Threaded Intermediate Joint for it is the *only* joint that is as strong as the pipe itself.

Now—your 2 in. Cast Iron Pipe from McWane comes in long factory assembled 18-foot lengths with only *one* intermediate joint.

Now—at one stroke McWane eliminates HALF the joints in your lines . . . speeds up installation . . . minimizes friction . . . all at no extra cost!

Here's more good news! McWane 9-foot lengths are cast *mechanically*. The sand is scientifically mixed and treated. The iron has a special analysis and is poured at *controlled* temperatures. Each individual length is given a 500-pound hydrostatic test . . . all assembled lengths get a 90-pound compressed air test under water. Write for folder WG-36!

McWANE CAST IRON PIPE CO. BIRMINGHAM ALABAMA

PACIFIC STATES CAST IRON PIPE CO. PROVO, UTAH

Branch Offices:
Chicago, Dallas, Denver, Kansas City, New York, Portland, Ore., Salt Lake City, San Francisco

over 20,000,000 FEET IN USE

American Locomotive Co. to Build Sulzer Diesel Engines

Effective April, 1936, Sulzer Brothers, of Winterthur, Switzerland, has licensed the American Locomotive Co. to manufacture, use and sell the internationally known Sulzer-designed two-cycle diesel engines. These diesel engines will be built and offered in this country by the McIntosh & Seymour Corporation of Auburn, N. Y., a subsidiary of the American Locomotive Co., under the trade name, Alco-Sulzer diesel engines.

While Sulzer Brothers was established in Winterthur, Switzerland, in 1834, the name has been identified with the metal-working industry since 1775. The reputation of this organization is largely based on its work in developing the modern steam engine. Its first steam engine was built in 1851 and its first boiler in 1841.

As early as 1893, the same year that Rudolf Diesel secured his first patent, Sulzer Brothers secured the manufacturing rights of the diesel oil engine, and was therefore actively engaged in diesel engine development from the start. The first experimental engine was built in 1896, and manufacture on a large scale was taken up in 1903. Special attention has been devoted to two-cycle diesel engine development and many large Sulzer units have been supplied to electric power stations in all parts of the world. The greatest power developed per cylinder is represented by a single cylinder of 2,000 hp.

Today Sulzer Brothers has an international reputation as builders of thoroughly modern efficient diesel engines, both two-cycle and four-cycle. The organization's outstanding success has been in the following lines: low and high speed stationary four-cycle diesel engines; direct reversible two-cycle marine diesel engines for warships and merchant ships; submarine diesel engines; auxiliary diesel engines for driving compressors and dynamos; and diesel engines for rail cars and locomotives. The total output of Sulzer diesel engines constructed up to date is more than 4,500,000 hp.

E. J. McCARTHY, GENERAL SALES MANAGER, THE GAMEWELL CO.

Changes in Gamewell Organization

Edward J. McCarthy has been appointed General Sales Manager of the Gamewell Company, with headquarters at the general offices, Newton Upper Falls, Mass. Mr. McCarthy has been with the Gamewell Company for over sixteen years. For twelve years he was in the Chicago office as Assistant District Sales Manager for the Middle West territory. About four years ago he was promoted to the position of District Sales Manager for the New England states.

L. E. Lowry, who has been associated with the Gamewell Company for over thirty years, has been appointed Sales Promotional Manager, with headquarters at Newton Upper Falls, Mass. For a number of years past, Mr. Lowry has been District Sales Manager of the Middle West territory, with headquarters at Chicago. He has the advantage of being intimately acquainted with the manufacture of fire and police signaling apparatus.

New Address for Chester Engineers

Chester, Campbell, Davis & Bankson, The Chester Engineers, engaging in design and supervision, appraisal and rates, utility accounting, and operation of water works, sewerage works, electric power plants, garbage works and drainage, announce the removal of their office from 717 Liberty Avenue to the Century Building, 130 Seventh Street, Pittsburgh, Pa. This organization is composed of J. N. Chester, J. T. Campbell, D. E. Davis, and E. E. Bankson.

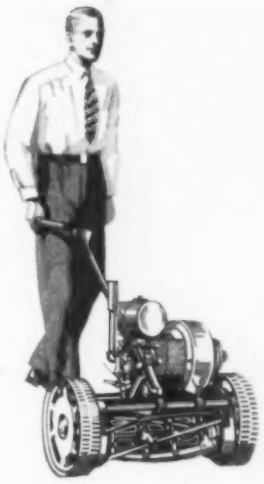
Alco Products Moves Office

Alco Products, Inc., Division of American Locomotive Co., has moved its offices to the 15th floor at 30 Church Street, New York, from its 42nd Street New York address.

Hand-Operated Power Mower

The Evinrude Lawn-Boy power mower, made by the Outboard Motors Corp., Milwaukee, Wis., is now available with rubber tires. For mowing around cemetery markers and monuments and for trimming along the walks of the average lawn, rubber tires have proved satisfactory because they are quiet-rolling and cause no damage.

This power lawn mower has one-hand control, and a simple, rotating hand grip gives free-wheeling for trimming. By pulling on the grip, the wheels are automatically disconnected while the cutting reel keeps on whirling. By dropping the handle, both reel and wheels stop. The far-forward position of the cutting bar and reel enables the Lawn-Boy to trim 6 inches closer to shrubs, trees and walls than a hand mower. This unit weighs only 95 pounds, cuts an 18-inch swath, is 25 inches wide and will mow up to 3 acres a day at a low fuel cost. A half-gallon runs the mower 4 to 6 hours. Speed is governor-controlled from 2 to 3½ miles per hour, and there are four cutting heights, from ⅝-inch to 1¾ inches. The mower can be equipped with a specially designed all-metal grass catcher of large capacity.



THE EVINRUDE LAWN-BOY POWER MOWER

A New Black Top Scarifier

A new scarifier for re-working oil-treated gravel and macadam roads has been announced by the Austin-Western Road Machinery Co., Aurora, Ill. This scarifier consists of a 31-tooth unit, mounted in place of the blade and standard scarifier attachment. The depth of cut is controlled hydraulically from the operator's platform, and either end of the scarifier can be raised or lowered independently. This permits the operator to set all teeth horizontal with the surface, or to set the teeth so that the front rows barely scratch the surface, while the rear teeth carry well into the material.

An adjustable blade set at the rear of the motor grader makes it possible to respread the material and windrow the excess in either direction. This new use of a motor grader is a result of the greater weight and power of the A-W 77 Senior dual 8-tire drive grader for which this attachment is supplied.

Ruggles Continues Work for Committee on Cast Iron Pipe Specifications

A. V. Ruggles, formerly Technical Assistant to the Secretary of the American Water Works Association, is continuing the duties which have occupied a considerable part of his time for the past 7½ years as Executive Assistant to the Chairman, T. H. Wiggin, of the Sectional Committee A-21, under the American Standards Association, on Specifications for Cast Iron Pipe. Mr. Ruggles is located at the office of the Secretary of that Committee, C. C. Simpson, Jr., Engineer of Distribution, Consolidated Edison Co., 130 East 15th Street, New York. Telephone ST-9-4900, Ext. 279.

Rigid control is assured by the use of hydraulic controls and ball-and-socket joints at all connecting points.

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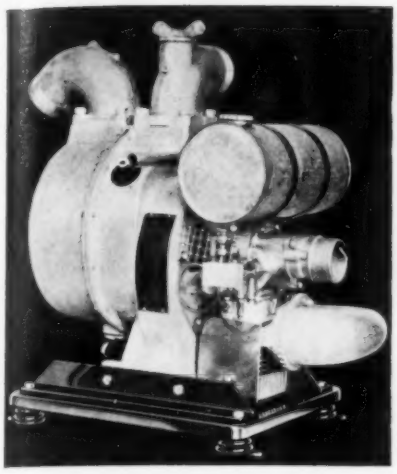


THE HOMELITE 3-INCH SELF-PRIMING PORTABLE PUMP

Self-Priming Portable Pump Handles 15,000 *Gallons per Hour*

A 3-inch self-priming centrifugal pump that handles 15,000 gallons of water per hour and weighs only 93 pounds complete has been developed by the Homelite Corporation, Port Chester, N. Y. This pump is a small unit with a built-in air-cooled gasoline engine. It can be carried by one man easily, handles muddy water or seepage and has a guaranteed suction lift of 28 feet.

This portable pump is said to be very economical to operate, and the manufacturer claims that it cuts down delays on emergency repair work on water mains and sewers, in that its portability permits it to be put on the job, the water pumped out and men working again before larger and heavier pumps could be put into operation.

The main parts of this pump, such as the pump body, crankcase and end plate, are made of a special abrasion-resistant aluminum alloy that weighs only one-third as much as cast iron. It is sturdy and weatherproof and will not overheat or freeze. A high-tension, waterproof magneto shoots a hot spark and makes starting easy. Because of its size, this pump can be readily stored in a tool-box, carried in an ordinary passenger car or tucked in an out-of-the-way corner of a truck.

Equipment Cleaning Unit in New Model

The Homestead Valve Manufacturing Co., Coraopolis, Pa., which for several years has been making high-pressure spray-cleaning equipment known as Hypressure Jenny, has announced its entry into the low-price cleaning equipment field with a new unit for use in cleaning trucks and other equipment, removing tar, grease and oil from concrete floors or highways, removing paint and rust from bridge or other structures, cleaning the walls of buildings, and similar tasks.

This Model G is operated on the same principle as previous models. Cleaning is accomplished by applying through a nozzle to the surfaces to be cleaned a combination of water vapor, hot water and cleaning chemicals over a pressure range from 50 to 150 pounds per square inch. The unit is fully contained, carrying water, solution and oil tanks, oil burner, vapor generator water and solution pump, electric motor and a specially constructed vapor hose with a variety of shaped nozzles.

Vapor pressure is developed by means of a vertical-spiral-parallel-coil type vapor generator, and is controlled by an automatic pressure control switch. The vaporizing oil-burning system burns standard kerosene or light furnace oil. The pilot flame is obtained by manual ignition, but is retained automatically after starting.

Both temperature and pressure are held within narrow limits of variation. A safety valve and full nozzle control give the operator complete command of the spray and eliminate danger of damage to the operator or the generator.

A saturation selector enables the operator to change the spray and have a wetter or dryer vapor as needed to obtain the proper effect. Paint thus may be stripped by using very hot water containing a strong alkali; or by adjusting the spray and pressure, tar or heavy grease may be blasted off.

The unit also has a single triplex plunger pump equipped with mechanically operated inlet check valves. This pump is so designed that without interruption it handles water, liquids containing chemicals, sticky fluids, gasoline and oils. In this case, it pumps both the oil to the burner and the water to the coils.

Model G Hypressure Jenny is made in both stationary and portable types. The stationary unit is mounted on a platform with legs which allow it to be raised several inches above the floor. Also, suitable means are provided for bolting the platform to the floor or other surface on which it is to be set up. The portable unit is mounted on a truck with 10-inch diameter semi-steel roller-bearing wheels, 2½ inches wide. Solid rubber-tired wheels are also provided where needed.

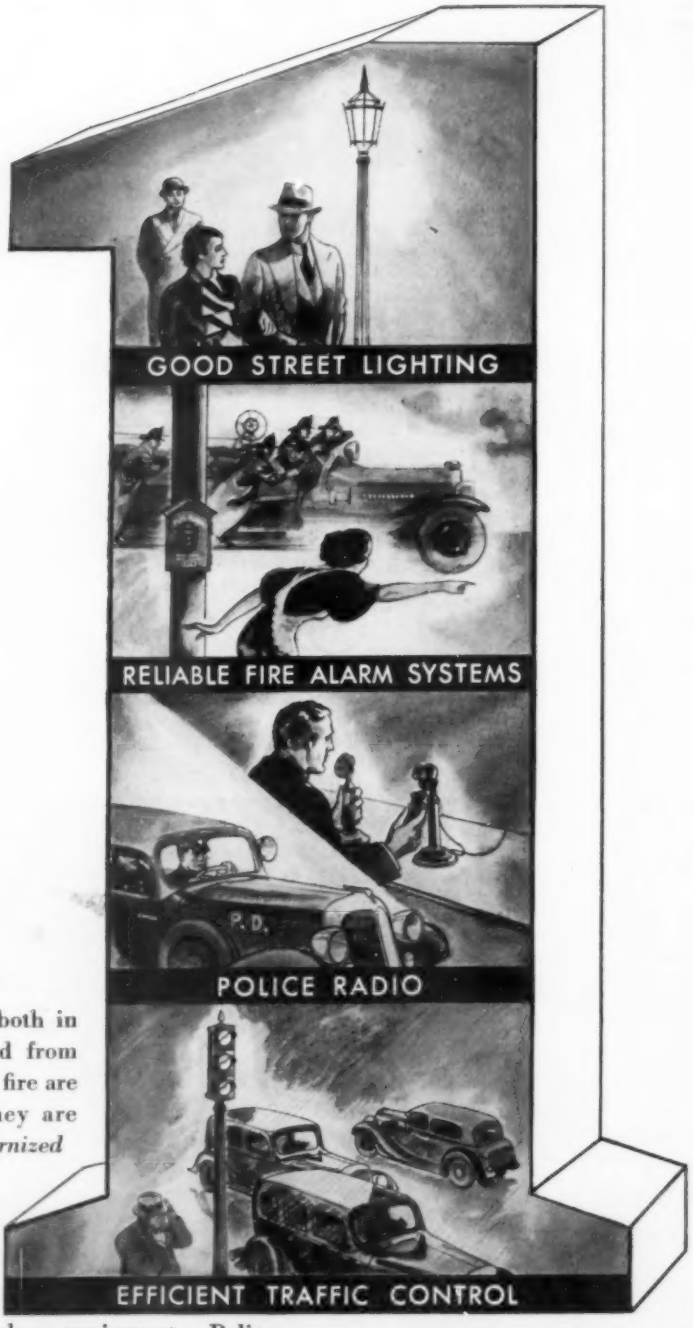
New Garbage Collection System in Chicago Suburb

Two Fruehauf dump trailers added recently by Elmwood Park, Ill., a Chicago suburb, to its garbage collection service can carry practically as much as three gravity-type dump-trucks. These trailers hold 12 cubic yards when filled to load level, and 16 cubic yards when the garbage is crowned. They are flexible and can be conveniently maneuvered.

The drop-frame construction of these dump trailers gives them a low loading height without sacrificing any of their large payload capacity. On each dump trailer, the hydraulic hoist is operated by means of Fruehauf's patented power fifth wheel, a device that does away with the customary hose connections. Each trailer is a Model 616-DF 16 feet 8 inches long, with brakes of the vacuum type, 17¼ x 3 inches in size. The tires are 32-inch x 6 inch 10-ply Gillette duals. The bodies are built by Wood and the tractor-trucks by International.

Officials of the Goodyear Tire & Rubber Co. compare the Double Eagle Airwheel that marked the completion of a quarter-billion tires by the company recently, with an All-Weather Tread tire of ten years ago. Left to right are: R. S. Wilson, Vice-President and Sales Manager; Paul W. Litchfield, President; L. E. Judd, Director of Advertising and Public Relations, and L. H. Shepherd, Manager of the Truck Tire Department

The public safety...FIRST!



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Outdoor Lighting

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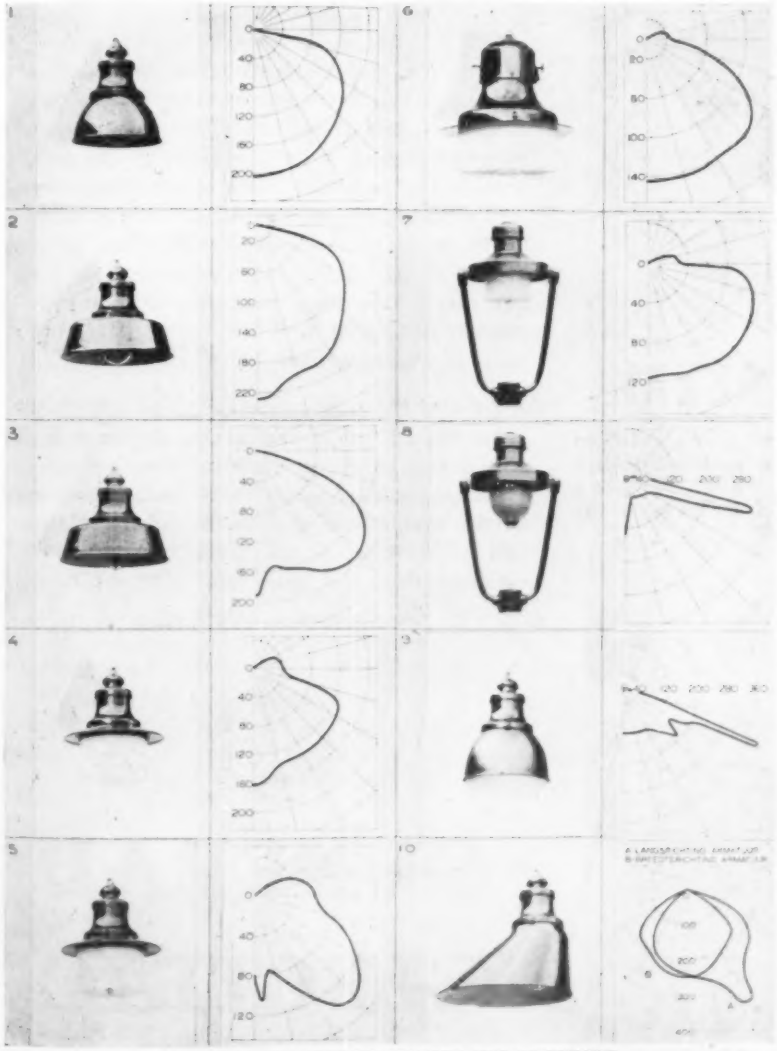
Notes on European Practice

By A. F. DICKERSON
Manager, Illuminating Laboratory,
General Electric Company, Schenectady, N. Y.



STREET LUMINAIRES IN COMMON USE IN EUROPE

THE large majority of European streets are gas-lighted, and many highways are not lighted at all, but there is increasing demand for better lighting, and electricity appears to be favored. Its relatively high cost compared with electricity cost in this country concentrates attention on the very efficient vapor lamps. Most English municipalities, for example, buy or generate current and do their own street lighting, and are therefore keenly interested in savings through decreased current consumption.

The photograph taken at Rugby shows part of a very creditable installation of 50 lanterns with 400-watt vertically mounted mercury vapor lamps, but does not depict the excessive glare which actually affected visibility and convinced me that the work done in the United States on the horizontal lamp with its more efficient control of light distribution is a step in the right direction.

Holland affords two interesting demonstrations. One is a stretch of sodium lighting with partially concealed sources, which shows the possibilities of such lighting when sufficient money is available to permit close spacing. The other consists of three roadways lighted, for comparison, with equal intensities of sodium, mercury, and incandescent lamps, located so that all three can be viewed from one location. The mercury lighting is not as good as the sodium, but better than the incandescent. When three bicyclists rode down the three roads simultaneously, the ease of visibility on the sodium-lighted road left no doubt in my mind that this type of lighting is superior to the others for highway application.

In Germany several installations of 400-watt mercury lamps present some of the best lighting on the continent. On the side streets, double rows of lamps spaced

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A copy of the publication on these new floodlights should be in the hands of every park official and of every electrical superintendent. When you ask for yours, check the coupon and obtain, also, our layout for the lighting of softball fields—one of the most popular applications of these new projectors. General Electric, Schenectady, N. Y.

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100 feet apart are suspended 30 feet above the pavement. The fixtures with cylindrical opal glass bands shielding the lamps are surprisingly effective. An installation of sodium-vapor lamps on the Hamburg road uses 70-watt lamps in porcelain-enameled reflectors, 30 feet high and 60 feet apart. The effect is good, but the distance visibility is not as good as with the first sodium-vapor highway lighting installation in the United States, on the Balltown road, Schenectady, where the spacing is four times as great and the lamps are 200-watt (10,000-lumen) size.

A noteworthy development in Paris is the use of reflectors which confine the light to an angle of 65 degrees from the vertical. Mirrored refractor-type and silvered glass reflectors are used. Spacing is close, mounting high, and illumination and visibility are excellent.

Most engineers in Europe have adopted American principles in street lighting, but their policy of mounting fixtures high and of centering them over the roadways merits our consideration.

European engineers seem to be unusually interested in the possibilities of reducing traffic accidents with light, and have received the whole-hearted cooperation of municipal and government officials in this endeavor. So great is the rivalry among different countries to improve lighting conditions that it is conceivable that street and highway lighting abroad may develop even more rapidly than it has in this country.

400-WATT MERCURY-VAPOR LAMPS; HEIGHT 25 FEET, SPACING 150 FEET; AT RUGBY, ENGLAND

Deaths Due to Dark Highways

HIGHWAY lighting is the remedy named on page 52 of the recent report of the two-year-old State Highway Survey Committee created in 1934 by joint resolution of the New York Legislature, for the fact that half of the fatal traffic accidents occur at night. The report quotes the State Bar Association findings of a total accident increase of 13 per cent in day accidents in the five years to 1933, and an increase of 26 per cent in night-time accidents. During these years there was no increase in fatal day accidents, but there was a 55 per cent increase in fatal night accidents.

The obvious answer to the problem is improved street and highway illumination, especially on main highways, and highways leading into cities where traffic is congested and where the headlights of automobiles tend to confuse rather than to aid the driver. To depend on illumination of the road from the vehicle itself is wrong in principle and has proved ineffective. Adequate highway lighting is now a matter which cannot be overlooked or disregarded in the search for highway safety.

The Committee therefore recommends that the Department of Public Works be given authority to establish and maintain highway illumination over not to exceed 100 miles of highways at such points as the Department believes would afford the best test of the effectiveness of the lighting, and also of the cost. The Committee feels that this is an extremely important subject and that lights should actually be installed at key locations by the Department of Public Works in order that the Legislature and the Department may have results of actual experience in determining future policy.

It is of course well known that the preponderance of fatalities at night is not confined to the highways but extends also to the streets. It is also known that lighting alone is not the answer, but *adequate* lighting. An example is cited by Captain John F. Healey of the Police Department of Lynn, Mass., in a statement of how Lynn won its commendable position in the Fourth National Traffic Safety Contest.

"In 1935," says Captain Healey, "Lynn, always a leader in well-lighted streets, still further increased the efficiency of the street-lighting system. Thousands of our 60-watt lamps were replaced by 200-watt lamps. The city electrical department extended our system farther into outlying districts, so that the city as a whole was exceptionally lighted during the last year. More than 3,000 street lights which were formerly shut off at 1 A. M. in the residential sections were allowed to burn all night, and 300 whiteway lights in the business section, formerly shut off at 11 P. M., were allowed to burn until 1 A. M. This added illumination certainly aided us in reducing night accidents, as last year only one person was killed during the night hours, while five were killed at night during 1934."

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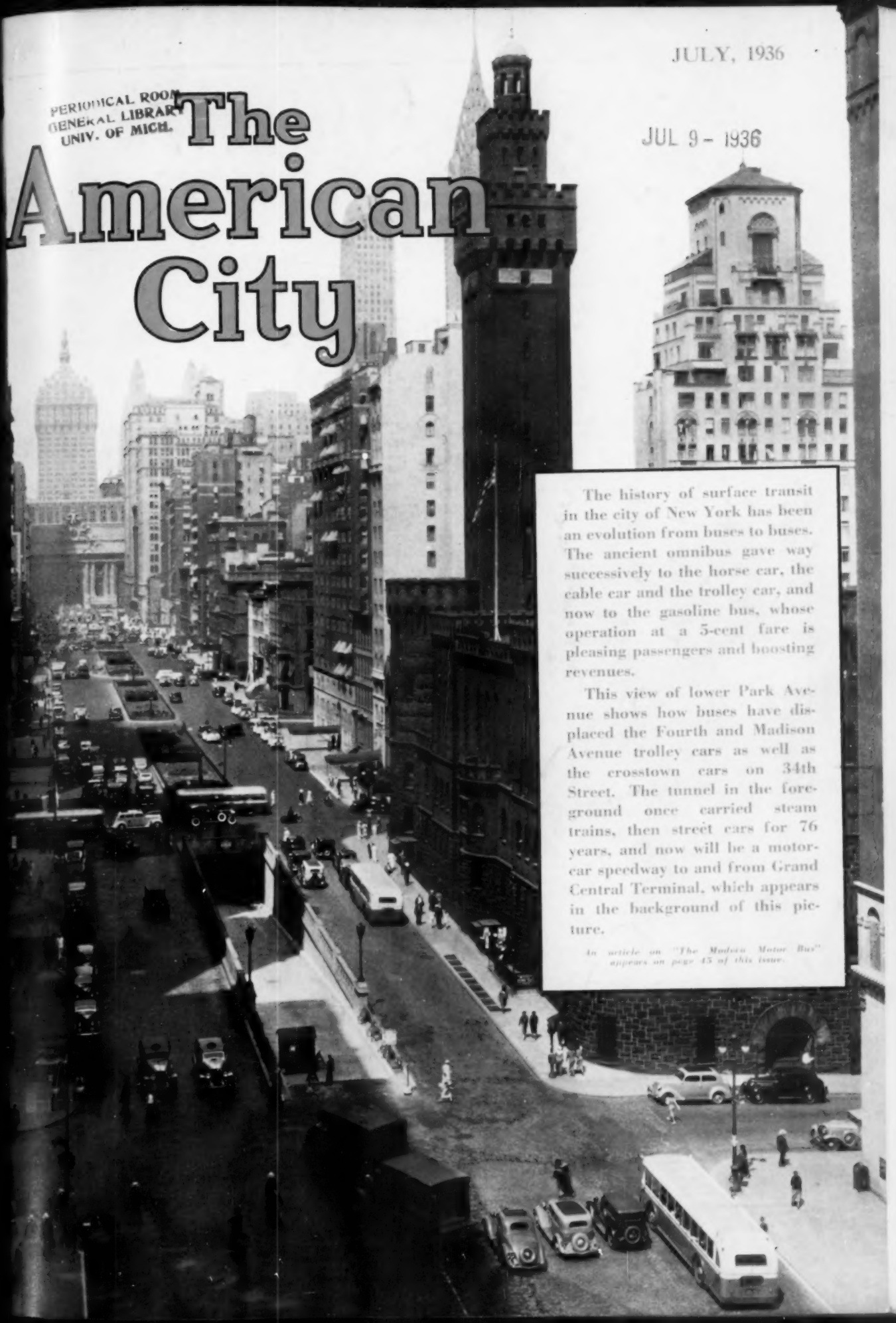

The history of surface transit in the city of New York has been an evolution from buses to buses. The ancient omnibus gave way successively to the horse car, the cable car and the trolley car, and now to the gasoline bus, whose operation at a 5-cent fare is pleasing passengers and boosting revenues.

This view of lower Park Avenue shows how buses have displaced the Fourth and Madison Avenue trolley cars as well as the crosstown cars on 34th Street. The tunnel in the foreground once carried steam trains, then street cars for 76 years, and now will be a motor-car speedway to and from Grand Central Terminal, which appears in the background of this picture.

An article on "The Modern Motor Bus" appears on page 45 of this issue.